# MARYLAND
# GEOLOGICAL SURVEY

SC 6046-1-77

# CONVERSION FACTORS AND ABBREVIATIONS

For those readers who may prefer to use metric (International System) units rather than the inch-pound units used in this report, values may be converted using the following factors:

| Multiply inch-pound unit | By | To obtain metric unit |
|---|---|---|
| foot (ft) | 0.3048 | meter (m) |
| foot per mile (ft/mi) | 0.1894 | meter per kilometer (m/km) |
| inch (in.) | 25.4 | millimeter (mm) |
| mile (mi) | 1.609 | kilometer (km) |
| square mile ($mi^2$) | 2.590 | square kilometer ($km^2$) |
| gallon (gal) | 3.785 | liter (L) |
| gallon per minute per foot [(gal/min)/ft] | 0.2070 | liter per second per meter [(L/s)/m] |
| million gallons (Mgal) | 3,785 | cubic meter ($m^3$) |
| foot per day (ft/d) | 0.3048 | meter per day (m/d) |
| foot squared per day ($ft^2/d$) | 0.09290 | meter squared per day ($m^2/d$) |
| cubic foot per day ($ft^3/d$) | 0.02832 | cubic meter per day ($m^3/d$) |
| gallon per day (gal/d) | 0.003785 | cubic meter per day ($m^3/d$) |
| gallon per minute (gal/min) | 0.06309 | liter per second (L/s) |
| million gallons per day (Mgal/d) | 0.04381 | cubic meter per second ($m^3/s$) |

In this report, chemical concentration in water is expressed in milligrams per liter (mg/L) or micrograms per liter ($\mu$g/L); 1,000 $\mu$g/L = 1 mg/L. The concentration unit of milliequivalents per liter (meq/L) takes into account the ionic charge and combining weight of an ion. In an analysis expressed in meq/L, unit concentrations of all ions are chemically equivalent. (See Hem, 1985, p. 56 for a further explanation and comprehensive listing of conversion factors.) Water temperature in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) using the following equation:

$$°F = 1.8\,(°C) + 32$$

Specific electrical conductance of water is expressed in microsiemens per centimeter at 25°C ($\mu$S/cm). This unit is equivalent to micromhos per centimeter at 25°C.

*Sea level:* In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929) — a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Sea Level Datum of 1929."

Department of Natural Resources
MARYLAND GEOLOGICAL SURVEY
Kenneth N. Weaver, Director

# BULLETIN 35

# HYDROGEOLOGY AND GROUND-WATER RESOURCES OF SOMERSET COUNTY, MARYLAND

by
William H. Werkheiser
U.S. Geological Survey

Prepared in cooperation with the
United States Department of the Interior
Geological Survey
and the
Board of Commissioners for Somerset County
1990

# CONTENTS

# CONTENTS—Continued



## ILLUSTRATIONS

[Plates are in pocket]

## ILLUSTRATIONS—Continued

## ILLUSTRATIONS—Continued



## MAPS SHOWING WELL LOCATIONS

# ILLUSTRATIONS—Continued



# TABLES

# HYDROGEOLOGY AND GROUND-WATER RESOURCES OF SOMERSET COUNTY, MARYLAND

by

William H. Werkheiser

## ABSTRACT

Somerset County, Maryland, an area of about 597 square miles, relies on ground water for 84 percent of its water supply. Development in the county is expected to substantially increase the demand for water; hence, an assessment of the ground-water resources was conducted to collect baseline information against which future change can be measured. Specific goals were to (1) refine the understanding of the hydrogeologic framework; (2) describe the quality of ground water; and (3) evaluate the effects on the ground-water-flow system of projected ground-water withdrawals at Princess Anne and Crisfield.

Somerset County is in the Atlantic Coastal Plain physiographic province, and is underlain by a wedge of unconsolidated sediments that forms a series of aquifers and confining units. The aquifers and aquifer systems that supply water are (1) the surficial aquifer system; (2) the Pocomoke aquifer; (3) the Manokin aquifer; (4) the Choptank aquifer; (5) the Piney Point aquifer; (6) the Paleocene aquifer system; and (7) the Potomac aquifer system.

The surficial aquifer system consists of fine-grained sediments, is relatively thin throughout much of the county, and is used primarily for domestic water supply. The aquifer system may produce more water in the northeastern part of the county, where it is coarser-grained and thicker. Chemical analyses of four samples suggest the water is soft to moderately hard and slightly acidic. In areas containing anoxic water, dissolved iron may be present in elevated concentrations. In areas of oxygenated water, nitrate concentrations may be elevated where water comes into contact with nitrogen sources.

The Pocomoke aquifer is present only in the southeastern part of the county. The median reported specific capacity of 68 wells tapping the unit is 10 gallons per minute per foot [(gal/min)/ft]. Specific capacity from five 1-hour tests performed during the investigation ranges from 2.0 to 17.3 (gal/min)/ft. The most common water-quality problems associated with the Pocomoke aquifer are elevated concentrations of iron and manganese. All but 2 of 24 samples exceeded the U.S. Environmental Protection Agency (USEPA) secondary maximum contaminant level (SMCL) for iron and 18 of 24 exceeded the SMCL for manganese.

The principal aquifer of use in Somerset County is the Manokin aquifer. The median reported specific capacity of wells in the unit is 5.2 (gal/min)/ft. Hydraulic conductivity, calculated from five aquifer tests near Princess Anne, averages 13.2 feet per day (ft/d), and storage coefficients range from 0.0002 to 0.001. Throughout much of the county, water-level altitudes in the aquifer are below sea level, with the lowest near Princess Anne. Because ground-water flow is chiefly toward the pumping centers at Princess Anne, poor-quality water from the southern part of the county, or the Chesapeake Bay, could migrate in that direction.

There is marked areal variation in the quality of water in the Manokin aquifer. North of Westover, water is soft to moderately hard, relatively low in dissolved solids, and of the sodium bicarbonate type. South of Westover, water is moderately hard to hard, contains higher concentrations of dissolved solids, and is of the sodium chloride type. In the northeastern corner of the county, iron concentrations generally exceed the USEPA SMCL of 0.3

milligrams per liter (mg/L). In the southern part of the county, chloride concentrations generally exceed the USEPA SMCL of 250 mg/L. The 250-mg/L isochlor trends roughly from Pocomoke City to Deal Island and passes about 1 mile (mi) north of Westover. The 500-mg/L isochlor is located about 2 mi southwest of the 250-mg/L isochlor.

Few wells produce water from the Choptank or Piney Point aquifers. Water from the Choptank aquifer is reported to contain chloride concentrations in excess of 900 mg/L, and water from the Piney Point aquifer contains dissolved solids in excess of 1,000 mg/L.

The Paleocene aquifer system is used only by the town of Crisfield as a source of water supply. Reported specific capacity of two wells screened entirely in the aquifer system is nearly 2 (gal/min)/ft. The Potomac aquifer system supplies water to several municipalities along the Chesapeake Bay. Reported specific capacities of four wells range from 1 to 7 (gal/min)/ft. Transmissivity and storage coefficient, estimated from a multiple-well aquifer test, are 2,140 $ft^2$/d (feet squared per day) and 0.0002, respectively. Transmissivity, estimated from a single-well aquifer test, is 1,280 $ft^2$/d.

Water from the Paleocene and Potomac aquifer systems is soft, has concentrations of dissolved solids ranging from 475 to 1,070 mg/L, and has the highest pH of any ground water in the county. The water is of the sodium-bicarbonate type, with sodium comprising more than 95 percent of the cations. Seven of 10 water-quality samples contained fluoride concentrations above the SMCL and two of these exceeded the USEPA primary maximum contaminant level (MCL). The extent and water quality of the two aquifer systems east of Crisfield are not known.

A digital, steady-state, ground-water-flow model was used to evaluate the effects of projected increases in pumpage of 600,000 gallons per day (gal/d) from the Manokin aquifer near Princess Anne. Simulated water levels in the Manokin aquifer ranged from 15 to 70 feet (ft) below those measured in November 1986. Using model-derived ground-water velocities, it would take about 50 years for ground water to move from the vicinity of the 250-mg/L isochlor to the nearest simulated pumped well at Princess Anne. A travel time of 300 years was estimated for the distance from the 500-mg/L isochlor to the same well. The analysis did not include the effects of dispersion, which could hasten the first arrival of brackish water (chloride concentration greater than 250 mg/L).

A non-steady analytical solution was used to estimate additional water-level declines that may result from projected pumpage from the Paleocene and Potomac aquifer systems in the Crisfield area. Using a range of transmissivity and a storage coefficient from aquifer tests, additional water-level declines were estimated to range from 7 to 31 ft. It is not known if poor-quality water is migrating toward the pumping centers, because the nature of the aquifer systems east of Crisfield is unknown.

# INTRODUCTION

Somerset County, a predominantly rural area located on the Eastern Shore of Maryland, depends on ground water for about 84 percent of its water supply. Although demand for ground water in the county is expected to increase because of population growth, the effects of increased withdrawals are not known. Of particular concern are the Princess Anne area, where a major State facility (Eastern Correctional Institution) recently has been constructed, and the harbor area of Crisfield. An assessment of the ground-water resources and the effects of anticipated ground-water withdrawals was conducted to aid in the long-term management of the resource. The study was done by the U.S. Geological Survey in cooperation with the Maryland Geological Survey and Somerset County.

## PURPOSE AND SCOPE

This report presents the findings of the assessment; specifically, the report (1) refines the description of the hydrogeologic framework of Somerset County; (2) describes the quality of ground water; and (3) describes the effects on the ground-water-flow system of projected increases in ground-water pumpage at Princess Anne and Crisfield.

Lithologic logs from well-completion records and published reports, along with geophysical logs, were analyzed for information on the hydrogeologic framework. Water levels measured in 65 wells from April 1986 through September 1987 were used to determine potentiometric surfaces of the aquifers. Eighty-one water-quality samples, collected from April 1986 through September 1987, were analyzed to assess ground-water quality. Ground-water-flow models were applied, to two sites, to evaluate the effects of proposed pumpage increases on the ground-water-flow system.

## DESCRIPTION OF STUDY AREA

Somerset County occupies part of the Atlantic Coastal Plain physiographic province which extends from Long Island, N.Y., to the Gulf of Mexico. It is located in the southwestern part of the Eastern Shore of Maryland (fig. 1). The land area of the county is about 597 $mi^2$ (square miles). Of this total area, 46 percent is covered by water, 21 percent is forested, 16 percent is used for agriculture, 16 percent is wetland, and 1 percent is developed (J. Windsor, Somerset County Department of Technical and Community Services, oral commun., 1988). Topographically, Somerset County is essentially a low-lying plain, with altitudes generally less than 20 ft (feet) above sea level. In the northeastern corner near the Somerset County-Wicomico County line, altitudes are somewhat greater, reaching 50 ft above sea level.

Population of the county was 19,188 in 1980 (U.S. Department of Commerce, 1981), with the greatest concentration along the highway corridor between Salisbury, Md. and Pocomoke City, Md., and in the harbor area of Crisfield.

Figure 2 shows the annual precipitation for the period of record at Princess Anne. The average annual precipitation for the periods 1949-57, 1959-64, and 1966-84 is 44.44 in. (inches) (National Oceanic and Atmospheric Administration, 1984). Data were incomplete for 1958 and 1965, and are not shown on figure 2. Precipitation is fairly uniform throughout the year, although there tends to be more rainfall during July, August, and September. The driest year was 1966, with slightly more than 30 in. of precipitation; the wettest year was 1979 when more than 63 in. of precipitation fell.

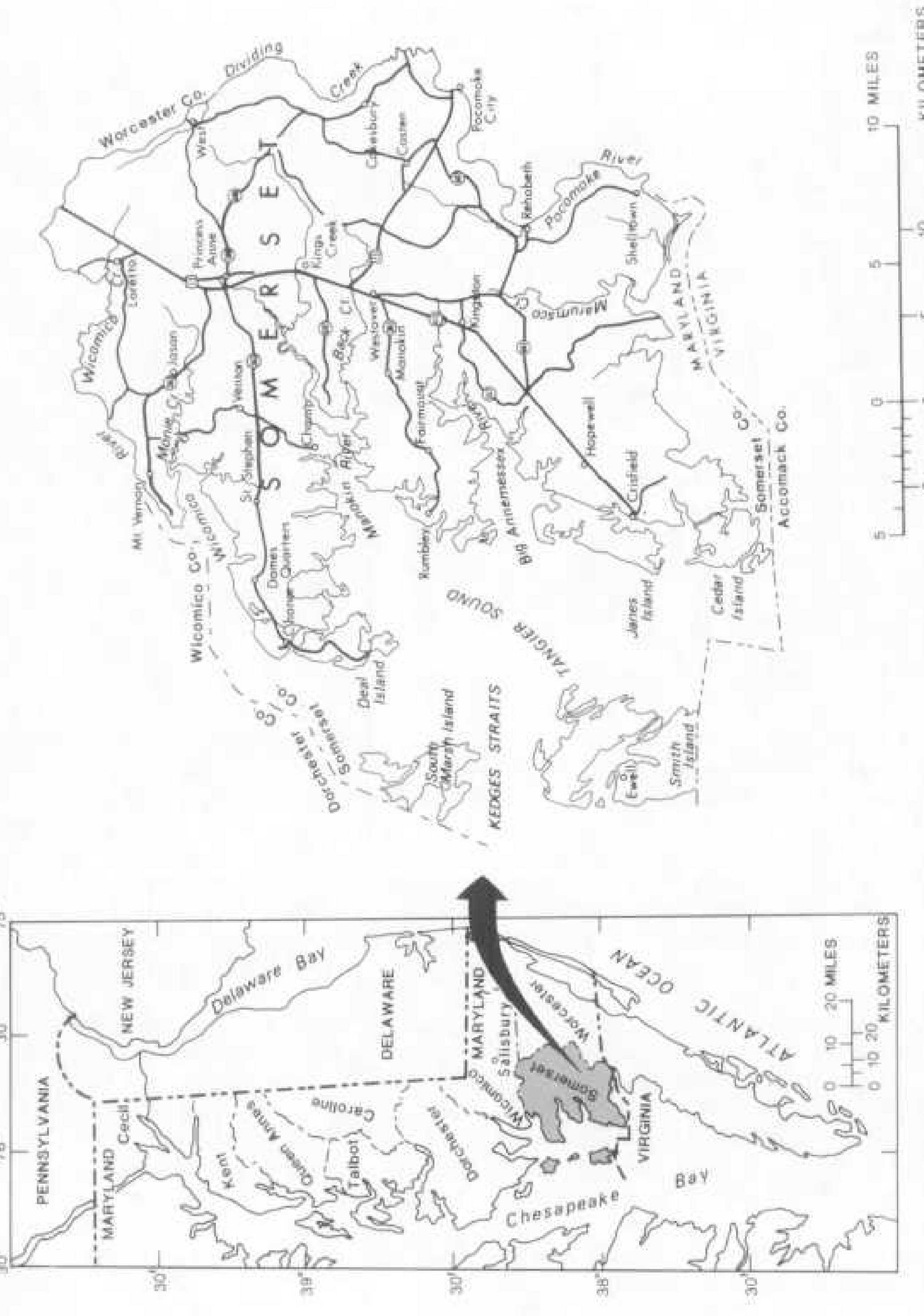



Figure 1.— Location of study area.

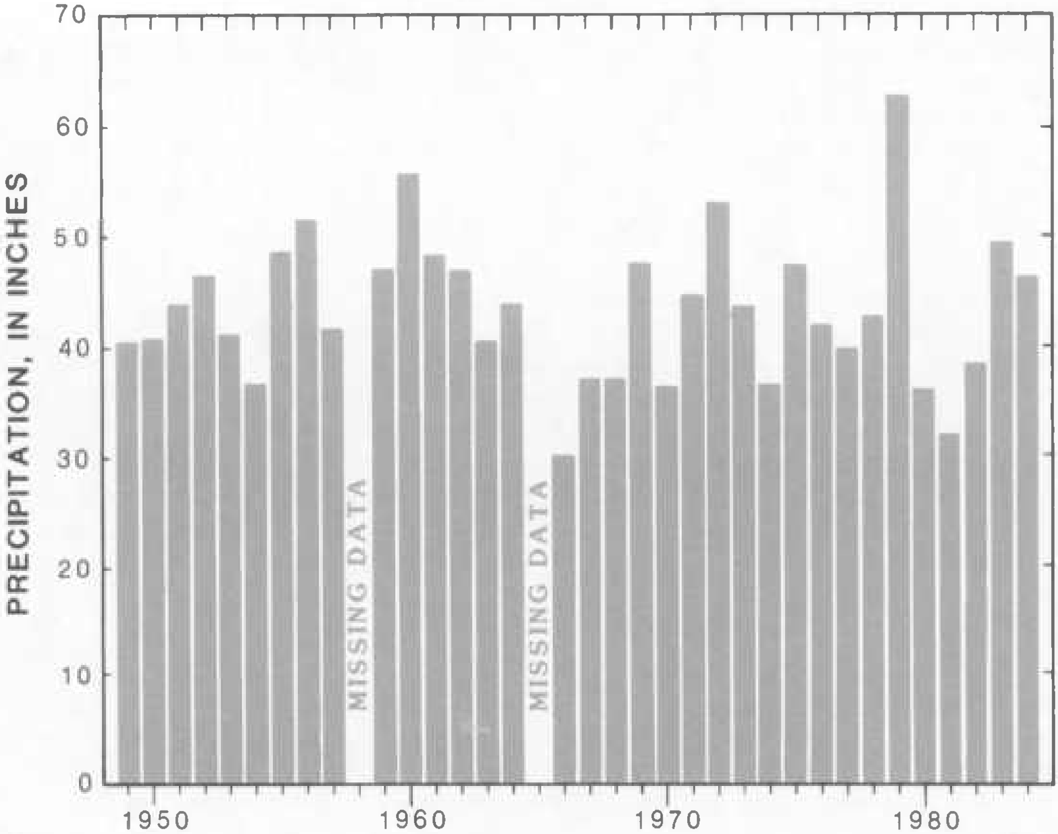



Figure 2.— Precipitation at Princess Anne, 1949-84.

## PREVIOUS INVESTIGATIONS

Rasmussen and Slaughter (1955) described the hydrogeologic framework and ground-water resources of Somerset County as part of an investigation of the water resources of Somerset, Wicomico, and Worcester Counties. Hansen (1967) presents hydrogeologic data from a test well drilled into the Cretaceous sediments at Janes Island State Park. The hydrogeology and stratigraphy of a 1,515 foot well drilled at the Eastern Correctional Institution in 1989 is described by Hansen and Wilson (1990). Several studies have examined the ground-water resources of Somerset County as part of regional hydrogeologic investigations. Cushing and others (1973) describe the water resources of the Delmarva Peninsula. Bachman and Wilson (1984) included the northeastern part of Somerset County in their study of the surficial Columbia aquifer of the Eastern Shore of Maryland. A study of regional ground-water flow in the Atlantic Coastal Plain of Maryland, Delaware, and the District of Columbia, includes Somerset County (D.A. Vroblesky and W.B. Fleck, U.S. Geological Survey, written commun., 1986). Water-quality data from Somerset County wells are included in Knobel (1985).

The geology of Somerset County was mapped by Owens and Denny (1984). Regional geologic investigations that include the county were conducted by Owens and Denny (1979), Brown and others (1972), and Mixon (1985). Hansen (1981) discussed the relationship of the Columbia Group to the underlying Miocene aquifer complex; and Hansen (1978) investigated Upper Cretaceous and Paleocene pinchouts in the Maryland part of the Salisbury Embayment.

### WELL-IDENTIFICATION SYSTEM

The locations of wells described in this report are shown on 5-minute quadrangle maps at the end of the report. An index map of the 7 1/2-minute quadrangle maps used to derive these maps is given in figure 41 at the end of the report. Wells are identified in this report in accordance with the Maryland Geological Survey numbering system. Each identifier consists of two pairs of letters followed by a number (for example, SO Bf 19). The first pair of letters indicates the county (SO for Somerset); the second pair designates one of the 5-minute quadrangles of latitude and longitude into which each county has been subdivided (fig. 42 at end of report). The number identifies a specific well within a 5-minute quadrangle.

### ACKNOWLEDGMENTS

The many homeowners, farmers, and businesses who allowed access to their wells for water-level measurements and collection of water-quality samples are gratefully acknowledged. Valuable information on the location and characteristics of wells in Somerset County was provided by Philip Pryor and Linda Collier, of the Somerset County Health Department. Staff of the Maryland Water Resources Administration are acknowledged for responding to various information requests and for installing two piezometers. Dr. Harry J. Hansen, of the Maryland Geological Survey, reviewed and edited the hydrogeologic sections contained in this report. His suggestions are much appreciated.

## HYDROGEOLOGY AND GROUND-WATER RESOURCES

### GENERAL DESCRIPTION

Somerset County is underlain by a wedge of generally unconsolidated sand, silt, and clay strata that dip to the southeast. This wedge is about 4,225 ft thick at Crisfield, Md., and thickens to the east at a rate of about 90 ft/mi (feet per mile) (Hansen, 1978, p. 4). In describing the water-bearing properties of these sediments, the terms aquifer and aquifer system are used. An aquifer is a body of earth material capable of yielding significant quantities of water to wells and springs. An aquifer system is a heterogeneous body of material that comprises two or more aquifers separated, at least locally, by confining units that impede ground-water movement but do not greatly affect the regional hydraulic continuity of the system (Laney and Davidson, 1986, p. 6-7). The aquifers and aquifer systems present in the county are: the surficial aquifer system, the Pocomoke aquifer, the Manokin aquifer, the Choptank aquifer, the Piney Point aquifer, the Paleocene aquifer system, and the Potomac aquifer system.

Table 1 summarizes the relation between geologic units, based on the lithology and paleontology of the sediments; and hydrogeologic units, based on the water-bearing properties of the sediments. The stratigraphy presented in this report is a compilation from previous geologic investigations. The nomenclature of Owens and Denny (1984) is used for the Holocene and Pleistocene units, and the Beaverdam Sand of the Pliocene Series. The designation "Yorktown and Eastover Formations (undifferentiated)" is used rather than the designation "Yorktown and Cohansey Formations" (Rasmussen and Slaughter, 1955, p. 43) because the age equivalency of the Yorktown Formation and the Cohansey Formation has been seriously questioned (Owens and Denny, 1979, p. A7; Hansen, 1981, p. 128; and Mixon, 1985, p. G14). The nomenclature of Rasmussen and Slaughter (1955) is used for the remainder of the Miocene units (St. Marys Formation, Choptank Formation, Calvert Formation). The nomenclature of Hansen (1978) is used for the Oligocene through Cretaceous units, except for the Paleocene units, which are not differentiated in this report. The hydrogeologic unit term "Paleocene aquifer system" follows the usage of the Maryland Geological Survey.

Plates 1-4 are hydrogeologic sections through Somerset County. Many of the geophysical logs shown (SO Bg 3, SO Ce 6, SO De 3, SO De 27, SO De 28, SO Ea 11, and WI Dd 23) are published in other reports (Hansen, 1967, fig. 13; Boggess and Heidel, 1968, p. 9; Hansen, 1978, fig. 10; and Hansen, 1981, fig. 2). Stratigraphic interpretations are based on these logs, and correlations are extended to other logs on the sections.

Plate 1 is a south-north hydrogeologic section that roughly parallels the strike of the units; plates 2-4 are west-east hydrogeologic sections that roughly parallel the dip of the aquifers. Plate 2 is the northernmost section along the dip and plate 4 is the southernmost. The surficial aquifer system is about 20 ft thick and directly overlies the Pocomoke aquifer along much of hydrogeologic section A-A′ (pl. 1). The Pocomoke aquifer is absent in the northwestern part of the county where it is truncated by the surficial aquifer system (pls. 2-4). Downdip, the surficial aquifer system and the Pocomoke aquifer are separated by a confining unit of silt, clay, and fine sand that thickens to the southeast.

The Manokin aquifer underlies the surficial aquifer system and the Pocomoke aquifer, and is separated from them by a confining unit that appears to be thick and laterally continuous. The Manokin aquifer is a distinct unit along hydrogeologic section B-B′ (pl. 2) and in the northern part of hydrogeologic section A-A′ (pl. 1), but is poorly developed along much of hydrogeologic section C-C′ (pl. 3), in the western part of D-D′ (pl. 4), and in the southern part of A-A′ (pl. 1). At some locations, such as at SO Bg 3 (pl. 2), gamma logs indicate that the Manokin aquifer grades into the underlying confining unit; whereas at other places (SO Ce 42, pl. 1), the contact between the two units is more sharply defined. Where the Manokin aquifer is poorly developed (SO De 27, pl. 3), it is difficult to distinguish the Manokin from overlying and underlying confining units.

The Manokin aquifer is separated from the underlying Choptank aquifer by a thick confining unit (St. Marys Formation). The Choptank aquifer is present at all locations where wells have been drilled to that depth (pls. 1-4); and it appears that the Choptank aquifer is present throughout Somerset County. Another thick confining unit separates the Choptank aquifer and the Piney Point aquifer (pls. 1, 3-4). The Piney Point aquifer appears to be laterally continuous in the southern part of the county. No wells have been drilled deep enough in the northern part of the county to determine the characteristics of the aquifer there.

The Paleocene aquifer system lies below the Piney Point aquifer. At Janes Island State Park and at Fairmount, the aquifer system appears to consist of three aquifers separated by confining units (pl. 1). Between Smith Island and Crisfield, however, the relation is more

TABLE 1
GEOLOGIC AND HYDROGEOLOGIC UNITS IN SOMERSET COUNTY
[correlation of units shown in each column under previous investigations not implied]

| System | Series | Previous investigations | | | | | | This report | |
|---|---|---|---|---|---|---|---|---|---|
| | | Geologic units | | | | | Hydrogeologic units | Geologic units | Hydrogeologic units |
| | | Rasmussen and Slaughter (1955) | Hansen (1978) | Hansen (1981) | Owens and Denny (1984) | Mixon (1985) southern Somerset County | Hansen (1967) Crisfield area | | |
| Quaternary | Holocene | Undifferentiated | Not studied | Shoreline Complex<br>?<br>Beaverdam Sand | Alluvium, swamp, and tidal marsh deposits | Estuarine marsh deposits | Undifferentiated | Alluvium, swamp, and tidal marsh deposits | Surficial aquifer system |
| | Pleistocene | Parsonsburg Sand<br>Talbot and Pamlico Formations<br>Walston Silt<br>Beaverdam Sand | Not studied | | Parsonsburg Sand<br>Kent Island Formation<br>Omar Formation | Pocomoke River alluvium<br>point-bar deposits<br>Kent Island Formation | | Parsonsburg Sand<br>Kent Island Formation<br>Omar Formation | |
| Tertiary | Pliocene | Brandywine, Bryn Mawr, and Beacon Hill gravels (Red Gravelly Sand) | Not studied | "Red Gravelly Sand" Canyon | Beaverdam Sand<br>Yorktown Formation | Yorktown Formation | Not present | Beaverdam Sand<br>-?-------?-----<br>Yorktown Formation and | --?-----?--------<br>Confining unit<br>Pocomoke aquifer |
| | Miocene | Yorktown and Cohansey Formations (?): Upper aquiclude / Pocomoke aquifer / Lower aquiclude / Manokin aquifer<br>St. Marys Formation<br>Choptank Formation<br>Calvert Formation | Undifferentiated | Upper Miocene aquifer complex<br>St. Marys (?) Formation<br>Not studied | Yorktown (?) and Cohansey (?) Formations<br>Not studied | Eastover Formation<br>Not studied | Confining unit<br>Pocomoke aquifer<br>Confining unit<br>Manokin aquifer<br>Confining unit<br>Choptank aquifer<br>Confining unit | --?-----?-------<br>Eastover Formation (undifferentiated)<br>St. Marys Formation<br>Choptank Formation<br>Calvert Formation | Miocene series undifferentiated: Confining unit / Manokin aquifer / Confining unit<br>Choptank aquifer<br>Confining unit |
| | Oligocene | Not present | Not present | Not studied | Not studied | Not studied | Not present | Not present | Not present |
| | Eocene | Chickahominy Formation<br>Piney Point Formation<br>Nanjemoy Formation<br>Aquia Greensand | Piney Point Formation<br>Nanjemoy Formation | Not studied | Not studied | Not studied | Piney Point aquifer | Piney Point Formation | Piney Point aquifer<br>Confining unit |
| | Paleocene | Brightseat (?) Formation | Aquia Formation<br>Brightseat Formation | Not studied | Not studied | Not studied | Confining unit<br>"Paleocene" aquifer<br>Confining unit | Undifferentiated | Paleocene aquifer system<br>Confining unit |
| Cretaceous | Upper Cretaceous | Monmouth Formation<br>Matawan Formation<br>Magothy Formation<br>Raritan Formation<br>Patapsco and Arundel Formations | Not present<br>Potomac Group (undifferentiated) | Not studied<br>Not studied | Not studied<br>Not studied | Not studied<br>Not studied | Confining unit<br>Magothy aquifer<br>Confining unit<br>"Upper Raritan" aquifer<br>Confining unit<br>Not studied<br>Not studied | Not present<br>Potomac Group (undifferentiated) | Not present<br>Potomac aquifer system |
| | Lower Cretaceous | Patuxent Formation | | | | | | | |

complex, with the position and number of aquifers changing from Smith Island to Crisfield (pl. 4). Therefore, the vertical or lateral distribution of aquifers and confining units in the Paleocene aquifer system is difficult to predict. The contact between the Paleocene units and the Potomac Group was determined by Hansen (1978, fig. 10), based on paleontological evidence and geophysical logs from well SO Dc 3. That determination was used in this report and correlation was made from well SO Dc 3 to other wells on the basis of geophysical logs only. Therefore, the position of the contact between the Paleocene aquifer system and the Potomac aquifer system is uncertain. Also, in places the Potomac aquifer system and the Paleocene aquifer system may be hydraulically connected (pl. 4). There are limited data on the characteristics of the Potomac aquifer system (pls. 1, 3-4). However, because the Potomac Group is of nonmarine origin, it is likely that the aquifer system consists of discontinuous sand bodies of variable vertical and horizontal extent, separated by confining units of fine sand, silt, and clay. The characteristics of the various aquifers and aquifer systems are more fully explained in subsequent sections of this report.

## GROUND-WATER FLOW

Water enters the ground-water-flow system primarily by the infiltration of precipitation. Although water budgets were not developed for Somerset County, other studies on the Delmarva Peninsula indicate that on an annual basis, between 37 and 55 percent of the precipitation that falls eventually enters the ground-water system (Rasmussen and Andreasen, 1959; Johnston, 1976). Figure 3 schematically shows typical flow paths of water in the subsurface of Somerset County. Most water that infiltrates to unconfined aquifers (surficial aquifer system, and parts of the Pocomoke aquifer) discharges to nearby surface-water bodies or is utilized by plants and transpired to the atmosphere. Some water, however, moves downward from the unconfined aquifers to deeper, confined aquifers. Water also enters the confined aquifers of Somerset County by lateral flow from areas outside the county. Water in these deeper aquifers is discharged primarily by vertical leakage through confining units to other aquifers and by pumping. In some areas, vertical leakage into an aquifer is increased by ground-water withdrawals. The rate of ground-water movement through a confining unit separating two aquifers depends on the head difference between the two aquifers and the vertical hydraulic conductivity and thickness of the confining unit. If the head difference increases because water levels in an aquifer have declined in response to pumping, the rate of flow through the confining unit increases.

## GROUND-WATER AVAILABILITY

The quantity of water an aquifer theoretically can yield to wells depends primarily on the hydraulic characteristics of the aquifer. Information on reported well yields alone usually does not adequately characterize the water-producing capacity of an aquifer. Yields given in well-completion reports depend on the method of well construction, type of pump, the yield required, duration of pumping period, and the drawdown allowed during the yield test. A better means for comparing the water-producing characteristics of wells is specific capacity, which is the well discharge divided by the water-level drawdown in the well at the end of the yield test. Specific capacity more accurately reflects the hydraulic characteristics of the aquifer, but also is strongly affected by well construction.

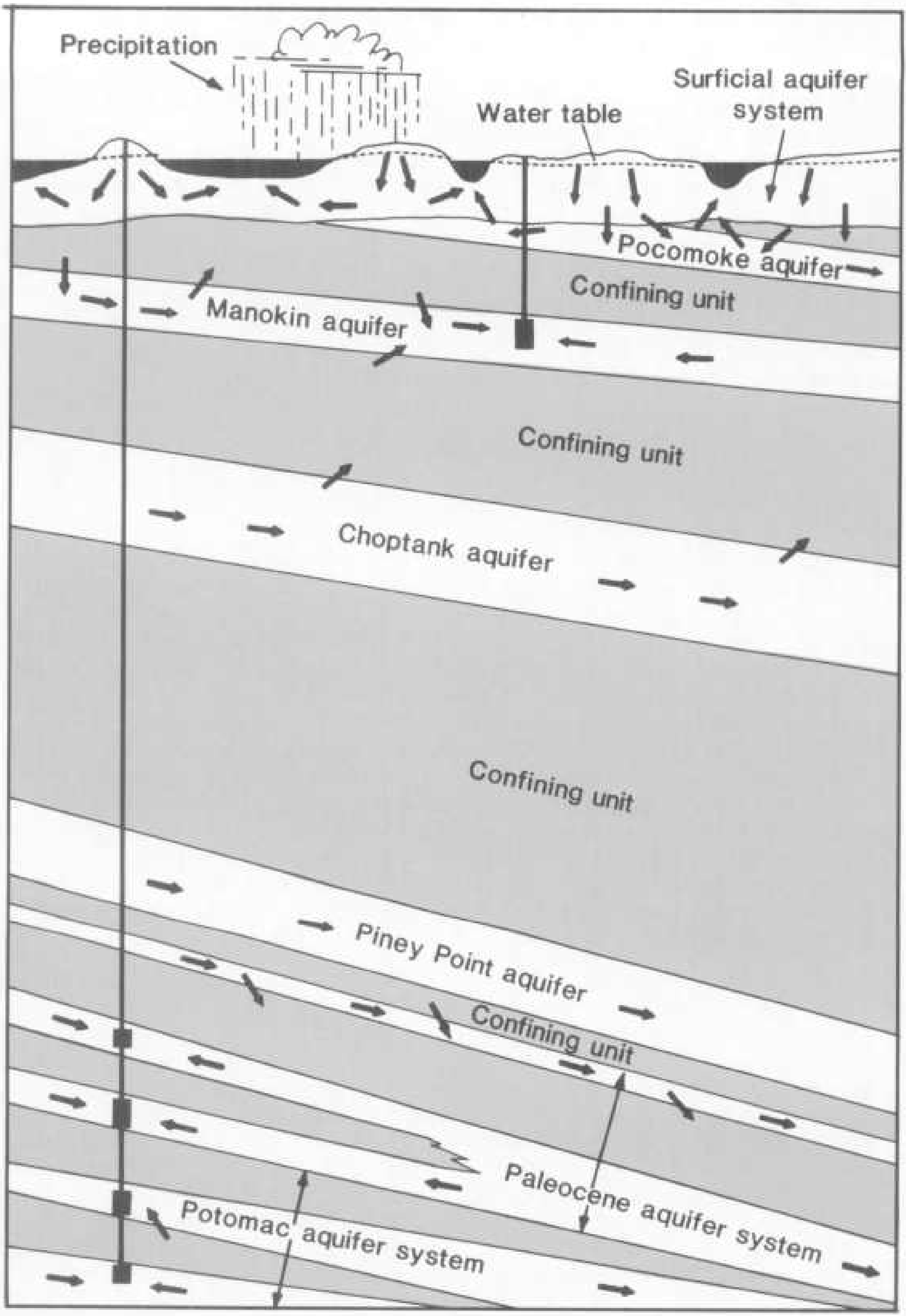



Figure 3.— Schematic representation of the ground-water-flow system in Somerset County.

The two terms used most often to describe the hydraulic characteristics of a confined aquifer are transmissivity and storage coefficient. Transmissivity is defined as the rate that water is transmitted through a unit width of aquifer under a unit hydraulic gradient (Lohman, 1972, p. 6). Transmissivity in a homogeneous, isotropic aquifer is related to the hydraulic conductivity and thickness of the aquifer by the equation:

$$T = Kb, \tag{1}$$

where:

T = transmissivity, in feet squared per day;
K = hydraulic conductivity, in feet per day; and
b = thickness of the aquifer, in feet.

The storage coefficient of an aquifer is defined as the volume of water the aquifer releases from or takes into storage per unit surface area per unit change in head (Lohman, 1972, p. 8). In an unconfined aquifer, the storage coefficient is approximately equal to the specific yield, which is defined as the ratio of the volume of water an aquifer will yield by gravity drainage to the total volume of the aquifer (Lohman, 1972, p. 6).

The transmissivity and storage properties of an aquifer are most frequently evaluated by conducting controlled tests that involve pumping a well for a specific period of time and measuring changes in water levels at nearby observation wells. In Somerset County, however, very few aquifer tests have been performed. More commonly, a specific-capacity test is conducted when a production well is installed. Transmissivity of a confined aquifer can be estimated from reliable specific-capacity data by using the following equation derived from the equation in Driscoll (1986, p. 1,021), which assumes a 6-in.-diameter well and a 24-hour test:

$$T = Q/s \times 270, \tag{2}$$

where:

T = transmissivity, in feet squared per day; and
Q/s = specific capacity, in gallons per minute per foot of drawdown.

For unconfined aquifers the approximation is:

$$T = Q/s \times 200. \tag{3}$$

Except where noted, the specific-capacity values in this section were obtained from well-completion reports. Reported values may differ considerably because of:

(1) Changes in hydraulic properties of the aquifer;
(2) differences in well construction;
(3) differences in the thickness of aquifer penetrated;
(4) inaccuracies in reported discharge;
(5) inaccuracies in reported drawdown; and
(6) differences in duration of the specific-capacity tests.

## WATER USE

Total water use in Somerset County has tripled since 1950, when estimated usage was 1.56 Mgal/d (million gallons per day). In 1986, water use was estimated to be 4.85 Mgal/d

(J.C. Wheeler, U.S. Geological Survey, written commun., 1988). Figure 4 illustrates water use by category, and shows that the largest amount of water used in Somerset County is for public supply, followed by irrigation, livestock, and commercial and industrial uses. Self-supplied, domestic water use accounted for only 12 percent of all water used in 1986. This contrasts with the distribution in 1950, when 34 percent of water use in the county was for self-supplied, domestic purposes (Rasmussen and Slaughter, 1955, p. 135).

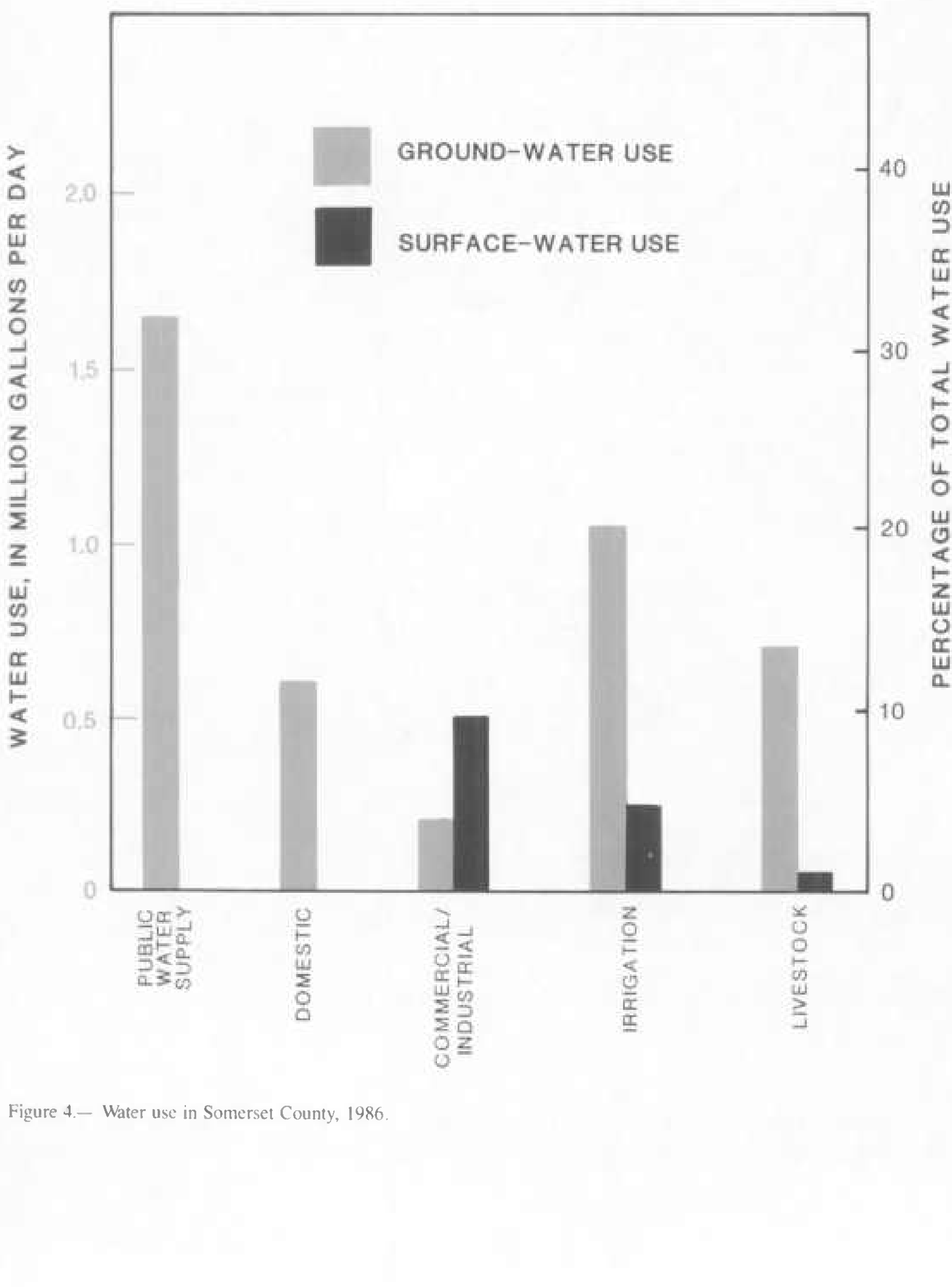



Figure 4.— Water use in Somerset County, 1986.

Figure 4 also shows that, in 1986, 84 percent of water use in Somerset County was from ground-water sources. Virtually all of the potable water in the county is ground water because most streams and rivers are tidal and contain brackish water. Figure 5 shows the locations of the public water-supply wells in the county, and the amounts of ground water each system produces. The largest municipal user of ground water is Crisfield, followed by Princess Anne, Smith Island, Fairmount, and a mobile home park near Eden. The public system that uses the least amount of ground water is the Rumbley-Frenchtown system.

Crisfield withdraws water from the Paleocene and Potomac aquifer systems, whereas Smith Island, Fairmount, and Rumbley-Frenchtown withdraw water from the Potomac aquifer system only. Princess Anne withdraws water from the Manokin aquifer, and the system near Eden withdraws water from both the surficial aquifer system and the Manokin aquifer. Table 2 lists users of more than 10,000 gal/d (gallons per day). In addition to municipal users, a plywood-manufacturing plant, and a poultry business also use more than 10,000 gal/d. The largest increase in ground-water use is expected to be in the Princess Anne area, where a State correctional facility has recently (1987) been constructed. This facility is expected to withdraw about 450,000 gal/d of ground water from the Manokin aquifer, when it is in full operation (J. Windsor, Somerset County Department of Technical and Community Services, written commun., 1986).

## AQUIFERS AND CONFINING UNITS

Although the principal sand units underlying Somerset County are water bearing, several of them are not used for water supply because they contain poor-quality water. The focus of this report is on those aquifers and aquifer systems that supply water suitable in quantities and quality for human needs. They are the surficial aquifer system, the Pocomoke aquifer, the Manokin aquifer, the Paleocene aquifer system, and the upper sands of the Potomac aquifer system. Aquifers that yield marginal or poor-quality water are the Choptank aquifer, the Piney Point aquifer, and the lower sands of the Potomac aquifer system. A number of wells (54) in the Crisfield area are screened in deposits that do not belong to any of the aquifer units listed above. The deposits are individual sands in confining units below the Pocomoke aquifer and above the Choptank aquifer. Because the Manokin aquifer may be poorly developed where these deposits are present, it is difficult to assign the deposits to a particular hydrogeologic unit. In this report, these deposits are undifferentiated and assigned to the Miocene Series.

### Surficial Aquifer System

#### Description

In this report, the uppermost aquifer system in Somerset County is called the surficial aquifer system and includes Holocene alluvium, and swamp and tidal-marsh deposits; the Parsonsburg Sand; the Kent Island Formation; the Omar Formation; and the Beaverdam Sand (table 1). As such, the surficial aquifer system is stratigraphically complex, and commonly exhibits numerous lithologic changes over short distances both laterally and vertically. Table 3 briefly describes the individual units of the surficial aquifer system and figure 6 shows the areal distribution of these units. In general, the alluvium, swamp deposits,

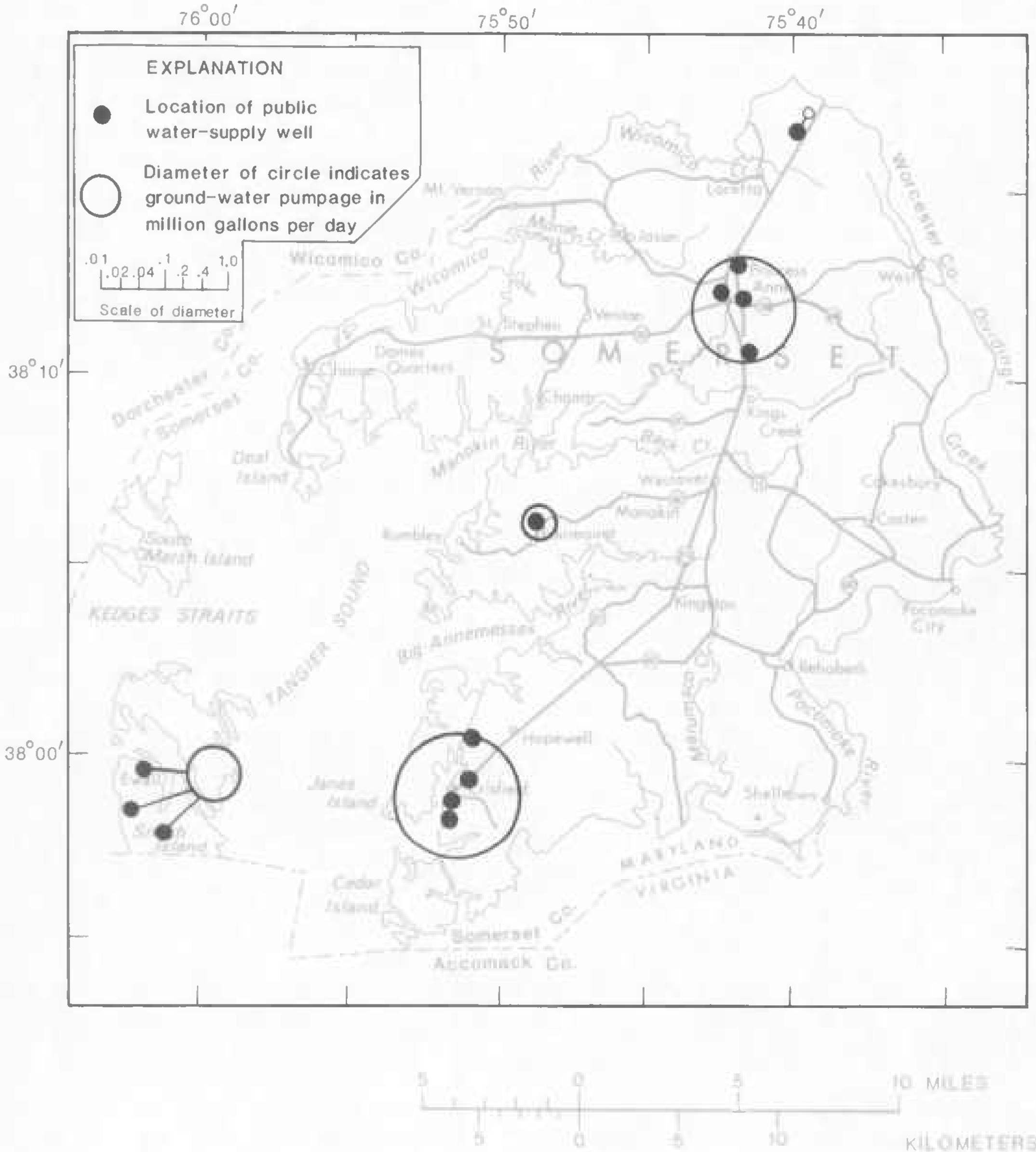



Figure 5.— Locations of wells and ground-water pumpage of public water systems that withdrew more than 10,000 gallons per day in 1986.

TABLE 2
GROUND-WATER USERS IN SOMERSET COUNTY, THAT WITHDREW MORE THAN
10,000 GALLONS PER DAY IN 1986
[PCPC = surficial aquifer system; PNPN = Piney Point aquifer; PCMK = Pocomoke aquifer;
PLCN = Paleocene aquifer system; MNKN = Manokin aquifer; PTMC = Potomac aquifer system]

| User | Well no. | Aquifer | Withdrawal rate, in thousand gallons per day |
|---|---|---|---|
| Chesapeake Plywood, Inc. | SO Df 10 | MNKN | 94.67 |
| | SO Df 11 | PCMK | |
| | SO Df 12 | PCMK | |
| | SO Dg 4 | PCMK | |
| City of Crisfield | SO Dc 4 | PTMC | 884.89 |
| | SO Ec 1 | PLCN | |
| | SO Ec 2 | PLCN | |
| | SO Ec 3 | PTMC | |
| | SO Ec 4 | PNPN | |
| | | PLCN | |
| | | PTMC | |
| | SO Ec 42 | PLCN | |
| | | PTMC | |
| | SO Ec 48 | PTMC | |
| | SO Ec 49 | PLCN | |
| | | PTMC | |
| Eden Mobile Home Park | SO Af 22 | MNKN | 22.77 |
| | SO Af 23 | PCPC | |
| | SO Af 24 | MNKN | |
| | SO Af 25 | MNKN | |
| Perdue, Inc. | SO Ce 85 | MNKN | 22.36 |
| | SO Ce 86 | MNKN | |
| Smith Island (7 systems) | SO Ea 3 | PTMC | 58.50 |
| | SO Ea 4 | PTMC | |
| | SO Ea 6 | PTMC | |
| | SO Ea 7 | PTMC | |
| | SO Ea 8 | PTMC | |
| | SO Ea 12 | PTMC | |
| | SO Ea 13 | PTMC | |
| Somerset County Sanitary District (Fairmount) | SO Cd 41 | PTMC | 33.20 |
| Somerset County Sanitary District (Princess Anne) | SO Be 51 | MNKN | 413.94 |
| | SO Be 54 | MNKN | |
| | SO Be 56 | MNKN | |
| | SO Be 78 | MNKN | |

TABLE 3
GEOLOGIC UNITS IN THE SURFICIAL AQUIFER SYSTEM (from Owens and Denny, 1984)

| Geologic Unit | Description |
|---|---|
| Alluvium, swamp, end tidal-mersh deposits, undifferentieted | Silt and clay, interbedded with some fine send. Found along the Chesepeake Bey end large streams. Typically less than 5 feet thick. |
| Parsonsburg Send | Predominently loose, light-colored quartz sand. Largest occurrence is a small uplend in the northeastern corner of the county. Thickness ranges from 4 to 20 feet. |
| Kent Island Formetion | Interbedded grevel, send, silt, end clay. Sendy end gravelly in the eestern pert of the county, where it overlies the Beaverdam Sand; clayey and silty in the western pert of the county. Thickness ranges from 3 to 10 feet, except in chennels, where it is up to 43 feet thick. |
| Omar Formation | Dark-gray silty send, silt, end silty clay. Occurs in a small eree neer the eastern border of the county. Meximum thickness is 25 feet. |
| Beaverdam Sand | Sand and silty sand, locally inter-bedded with grevelly sand, cley and silt. Underlies the northeastern part of the county. The unit may be as much as 100 feet thick in channels near the northeestern border of the county. |

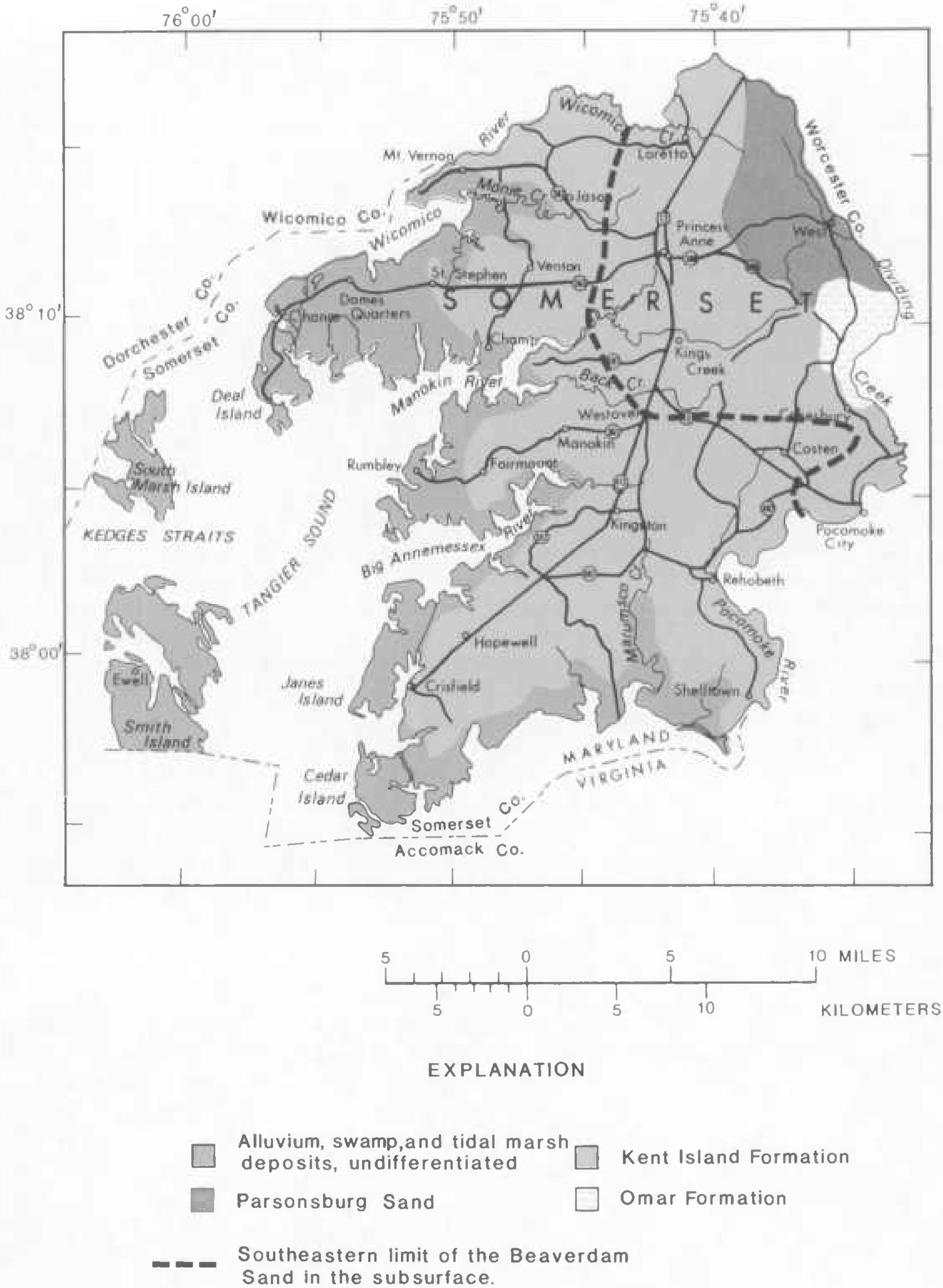



Figure 6.— Generalized geologic map of Somerset County (modified from Owens and Denny, 1984).

tidal-marsh deposits, and Omar Formation consist of silty sand, silt, and clay; the Parsonsburg Sand is composed of medium sand; and the Beaverdam Sand is sand and silty sand. The Kent Island Formation is gravelly and sandy where it overlies the Beaverdam Sand and silty and clayey where it overlies finer-grained sediments. As a whole, the aquifer system generally is coarser grained in the northeastern part of the county where it includes the Beaverdam Sand, and finer grained in the southwestern part of the county where the Beaverdam Sand is absent (fig. 6).

Plate 5 shows the thickness of the surficial aquifer system in Somerset County. The aquifer system is about 20 ft thick throughout most of the county, except in the northeastern part, where it is more than 40 ft thick. The geologic units that comprise the aquifer system were deposited on an erosional surface that contained numerous channels. Therefore, where these paleochannels are present, the aquifer system thickens. Hansen (1966) describes a paleochannel in the Salisbury area that is about 175 ft deep, and Owens and Denny (1979, p. A13) show paleochannels in the Maryland and Delaware portions of the Delmarva Peninsula. The thickening of the surficial aquifer system in the northeastern part of the county may be due, in part, to the infilling of a paleochannel. Generally, however, paleochannels in Somerset County are not of the magnitude of those described in other areas by Hansen (1966), and Owens and Denny (1979, p. A13). Mixon (1985, p. G18) and Owens and Denny (1984) show channels in the Yorktown and Eastover Formations and Yorktown and Cohansey Formations, respectively (Yorktown and Eastover Formations, in this report), that have maximum depths of 30 to 40 ft. Where the Pocomoke aquifer subcrops beneath the surficial aquifer system (pl. 6), sand-on-sand contacts make paleochannel identification difficult. In these areas, the base of the surficial aquifer system was determined from nearby wells that have a significant (5-10 ft) confining unit separating the aquifer system and the Pocomoke aquifer. Therefore, sediments in paleochannels in the recharge areas are included in the Pocomoke aquifer.

The surficial aquifer system is used primarily as a source of domestic water supply, as the generally thin deposits of the aquifer system preclude its use for public water supply. In the northeastern part of the county, however, where the aquifer system is thicker, larger quantities of water may be obtainable. Also, in areas where the surficial aquifer system directly overlies the Pocomoke aquifer (pl. 6), the two units in combination may yield significant quantities of water.

### Well yield and specific capacity

Reported yields of 12 wells in the surficial aquifer system range from 4 to 80 gal/min (gallons per minute). The median reported well yield is 12 gal/min. Reported specific capacity ranges from 1.3 to 27 (gal/min)/ft (gallons per minute per foot), with a median value of 3.4 (gal/min)/ft. Although the data are not sufficient to adequately describe areal distributions of well yield or specific capacity, yields are generally greater in the northeastern part of the county where the aquifer system is thicker.

### Water levels

Somerset County is highly dissected by streams and drainage ditches that drain the surficial aquifer system. Consequently, water levels in the surficial aquifer system are adjusted to water-surface altitudes in the streams and ditches. In the northeastern part of the county where stream altitudes are highest, water levels in the aquifer system also are high. Likewise, in the southwestern part of the county, streams are tidally influenced and water levels in the aquifer system are only a few feet above sea level (fig. 7).

Water levels in the surficial aquifer system respond to seasonal changes in recharge and evapotranspiration. Figure 8 shows water levels in well SO Cf 2 for 1949-88. Seasonal fluctuations are evident as water levels rise to about 1 ft below land surface in the spring and decline to 6 ft below land surface in late summer. These seasonal fluctuations occur because, from fall to early spring, evapotranspiration is low and precipitation is moderate, resulting in recharge to the unconfined aquifers. During the late spring and summer growing season, evapotranspiration is high, so little precipitation reaches the water table. Accordingly, water levels decline until the growing season ends, and then begin their seasonal recovery.

## Confining Unit between the Surficial Aquifer System and Pocomoke Aquifer

In the eastern and southeastern part of Somerset County, a confining unit retards the vertical movement of water between the surficial aquifer system and the Pocomoke aquifer (pls. 1-4). This confining unit is in the upper part of the Yorktown and Eastover Formations (undifferentiated) and consists primarily of clay and silt (Mixon, 1985, p. G10-G14) except in the vicinity of Costen. In this area, there are no fine-grained sediments separating the surficial aquifer system and the Pocomoke aquifer. The confining unit in this area may be primarily sand, or the unit may have been eroded and replaced with sands of the surficial aquifer system. In either case, vertical ground-water flow between the surficial aquifer system and the Pocomoke aquifer is probably greater in this area than in areas where the clay and silt separate the two aquifers. Thickness of the confining unit ranges from zero where it is truncated by the surficial aquifer system to about 65 ft at Rehobeth (pls. 1-4).

## Pocomoke Aquifer

### Description

The Pocomoke aquifer, which is part of the Yorktown and Eastover Formations (undifferentiated) (table 1), is present only in the southeastern two-thirds of the county (pl. 6). It consists primarily of gray, fine- to medium-grained fossiliferous sand with stringers of gravel and coarse sand (Rasmussen and Slaughter, 1955, p. 101). Locally, the aquifer contains glauconitic sand and clay and silt interbeds (Owens and Denny, 1979, p. 9).

Plate 6 shows recharge areas and altitude of the top of the Pocomoke aquifer. Recharge to the aquifer occurs primarily where it directly underlies the surficial aquifer system. This is in a 1- to 5-mi (mile) wide band that trends from southwest to northeast through Somerset County. The Pocomoke aquifer may receive additional ground-water recharge from leakage from the surficial aquifer system in the vicinity of Costen.

The top of the aquifer generally slopes to the southeast, with altitudes ranging from about 20 ft below sea level at the northwestern limit of the aquifer to 70 ft below sea level near the county line at Pocomoke City (pl. 6). The number and vertical position of silt and clay units

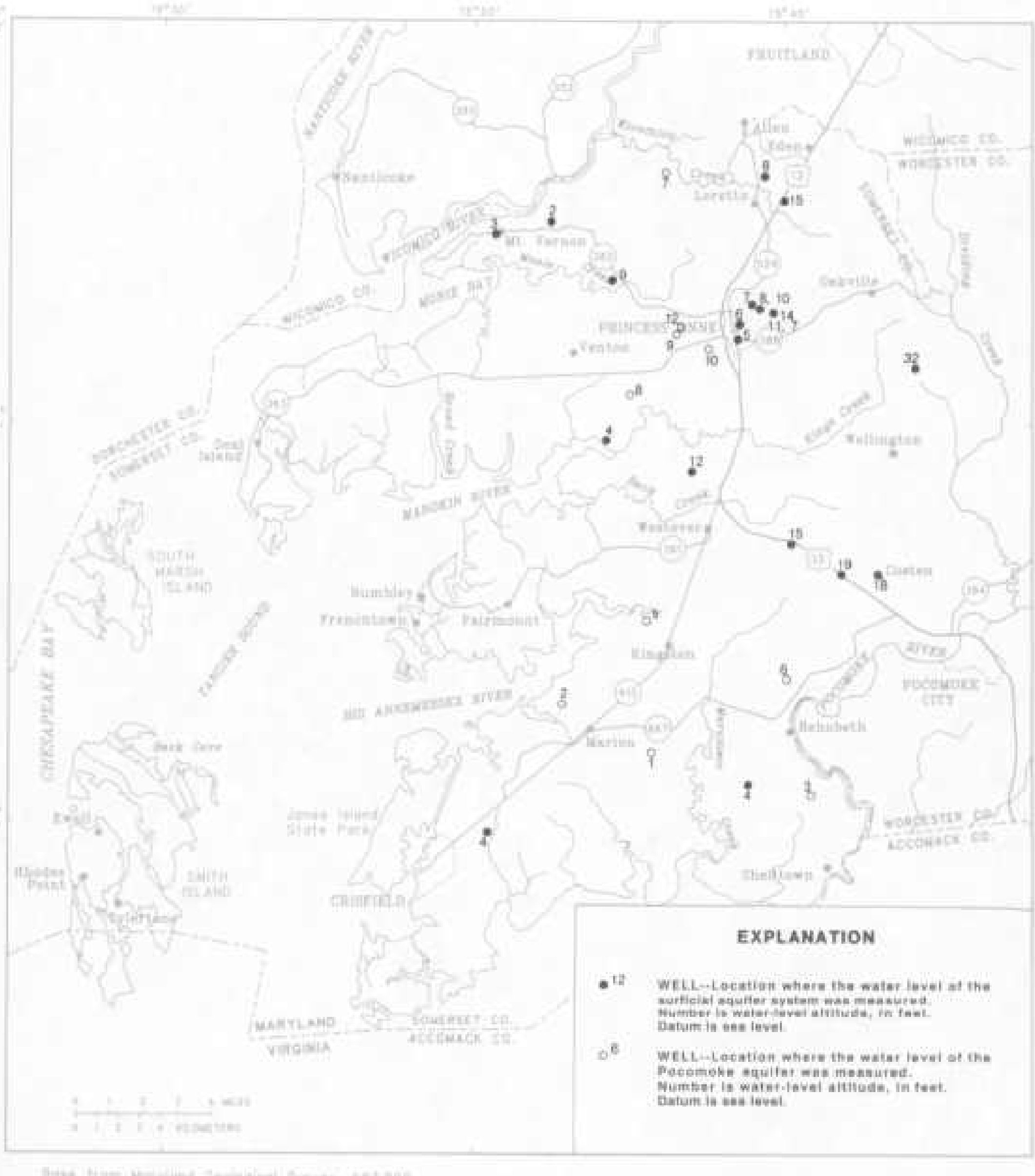



Figure 7.— Water-level altitudes in the surficial aquifer system and the Pocomoke aquifer, April 1987.

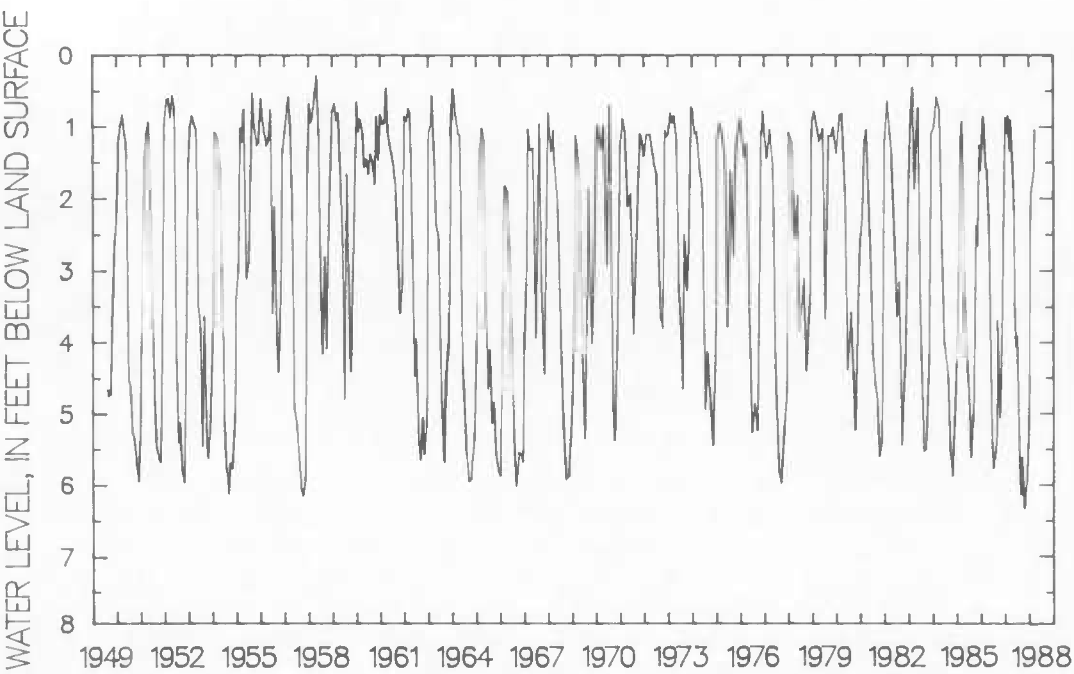



Figure 8.— Water levels in observation well SO Cf 2, 1949-88 (well location shown on quadrangle map Cf at end of report).

in the aquifer differs, making identification of the top and bottom of the aquifer difficult in places. This may account for some of the variation in the altitudes shown on pl. 6. Thickness of the aquifer also is variable (pl. 7), and ranges from zero at its northwestern limit to more than 75 ft in the southeastern part of the county.

The Pocomoke aquifer supplies water for domestic, irrigation, and industrial use in Somerset County and is the sole source of water for Pocomoke City, which is located southeast of the study area. In areas where both the Pocomoke aquifer and Manokin aquifer contain potable water, the Manokin is usually the aquifer used for drinking-water supplies, because water in the Pocomoke aquifer frequently contains greater concentrations of iron. In the southern part of the county, however, chloride concentrations in the Manokin aquifer exceed the secondary maximum contaminant level (SMCL) of 250 mg/L (milligrams per liter) (U.S. Environmental Protection Agency, 1986b) and the Pocomoke aquifer is preferred for potable water. Nearly all irrigation wells in Somerset County are screened in the Pocomoke aquifer because it is encountered at shallower depths and tends to contain more gravel beds than the Manokin aquifer (Owens and Denny, 1979, p. A9).

Well yield and specific capacity

Well yields reported in water-well completion reports for 104 wells in the Pocomoke aquifer range from 6 to 800 gal/min, with a median of 20 gal/min. Reported well yields for irrigation wells are generally greater than the median for all wells, and probably more accurately reflect the short-term, water-producing capacity of the aquifer. Reported yields for 24 irrigation wells range from 10 to 800 gal/min, with a median of 60 gal/min.

Specific capacities reported for 68 water wells range from 1 to 50 (gal/min)/ft with a median value of 10 (gal/min)/ft. Five 1-hour specific-capacity tests were conducted during this investigation. Specific capacity computed from these data ranges from 2.0 to 17.3 (gal/min)/ft (table 4).

Figure 9 shows the reported specific-capacity data for the Pocomoke aquifer. Throughout most of the county, reported specific capacity ranges from 5 to 10 (gal/min)/ft. In the center of the county, however, specific capacity increases to over 20 (gal/min)/ft. Because of the variability in reported values, the specific-capacity data in figure 9 are approximate and cannot be used to determine the value of specific capacity at a particular site.

### Hydraulic properties

Transmissivity and storage coefficient of the Pocomoke aquifer are unknown as no aquifer-test data are available for Somerset County. In Pocomoke City, which is located southeast of Somerset County, transmissivities calculated from two aquifer tests are 1,070 $ft^2/d$ (feet squared per day) and 5,350 $ft^2/d$ (Rasmussen and Slaughter, 1955, p. 145-150). Storage coefficients calculated from these aquifer tests are 0.003 and 0.0002, respectively. These values indicate that the water-yielding capacity of the Pocomoke aquifer may change considerably over short distances.

### Water levels

There are no long-term observation wells screened in the Pocomoke aquifer in Somerset County, and water levels were measured in only nine wells in the Pocomoke aquifer during this investigation (fig. 7). Therefore, temporal and spatial water-level trends in the Pocomoke aquifer are unknown. However, in recharge areas (pl. 6) the Pocomoke aquifer is unconfined and water levels probably are controlled strongly by local streams and drainage

TABLE 4
SPECIFIC CAPACITY OF SELECTED WELLS IN THE POCOMOKE AQUIFER
[(gal/min)/ft = gallons per minute per foot]

| Well no. | Specific capacity [(gal/min)/ft] |
|---|---|
| SO Be 77 | 3.2 |
| SO Be 88 | 17.3 |
| SO Dd 58 | 3.3 |
| SO De 36 | 5.7 |
| SO Df 21 | 2.0 |

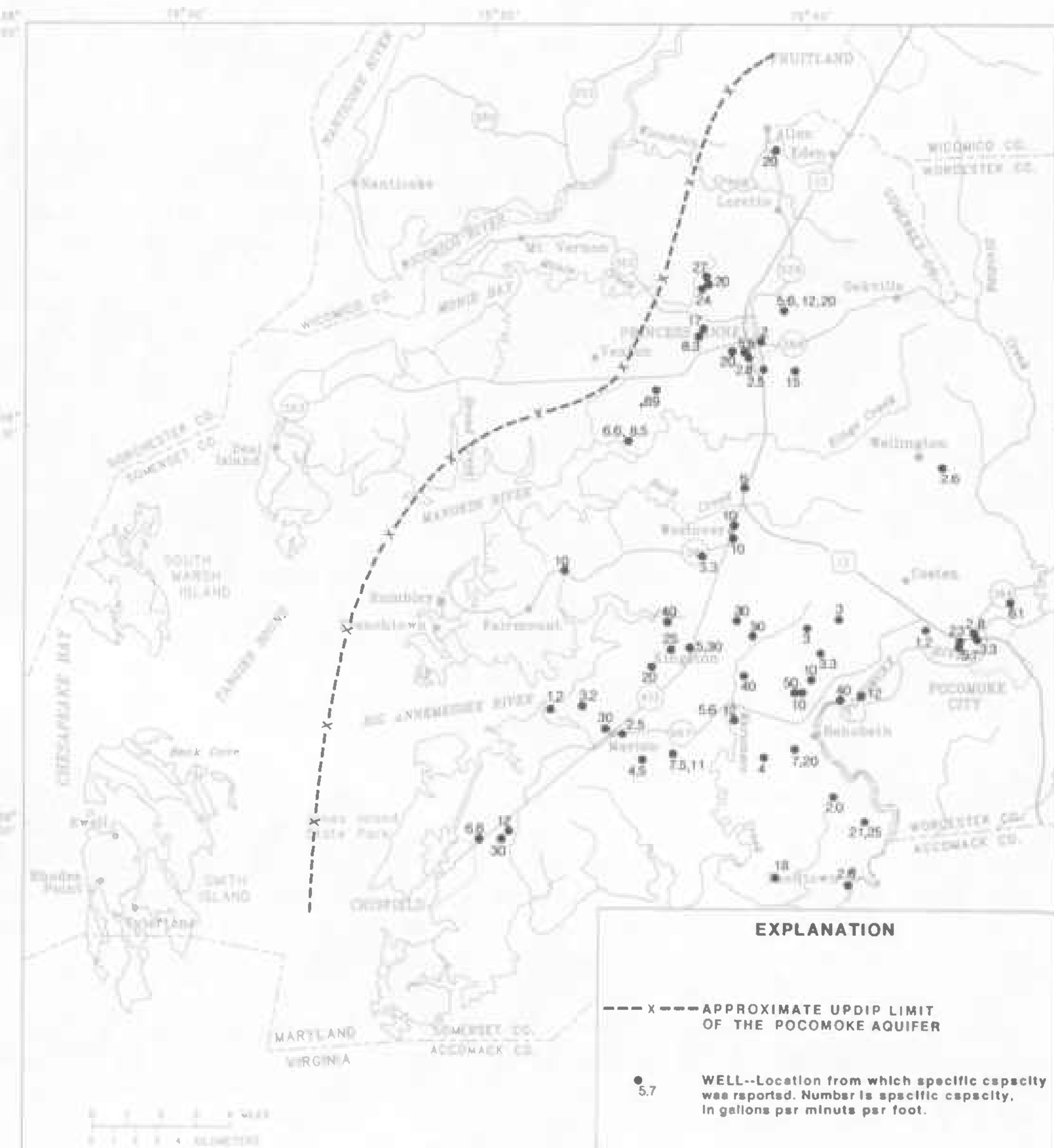



Figure 9.— Reported specific capacity of wells in the Pocomoke aquifer.

ditches (fig. 7). Where the Pocomoke aquifer is overlain by a confining unit, the vertical movement of water to and from the aquifer is inhibited and water levels are probably less influenced by local surface-water bodies.

## Confining Unit between the Pocomoke and Manokin Aquifers

A confining unit consisting of silt, clay, and fine-grained sand separates the Pocomoke aquifer from the underlying Manokin aquifer (pls. 1-4). The thickness of the confining unit differs, ranging from less than 40 ft near Eden to more than 100 ft near Princess Anne (fig. 10). In the Crisfield area, the lithology of the confining unit changes from predominantly silt and clay to one characterized by more interbeds of sand. Several of these interbeds are transmissive enough to supply water to domestic wells in the area. The change in character of the confining unit in the Crisfield area also may allow more water to move vertically between the Pocomoke aquifer and the Manokin aquifer.

## Manokin Aquifer

### Description

The Manokin aquifer is the primary aquifer used for water supply in Somerset County. It is in the Eastover Formation and consists principally of gray, fine- to medium-grained sand and contains some shell material. In the western part of the county, in the area encompassing Fairmount, Kingston, Janes Island State Park, and Smith Island, the unit becomes finer grained and is no longer recognizable as a distinct aquifer in geophysical logs (pls. 1-4).

The Manokin aquifer subcrops beneath the Chesapeake Bay west of Deal Island and trends northeast through Dorchester and Wicomico Counties into Delaware near Seaford (Hansen, 1981, p. 129; Pickett, 1976). The top of the aquifer slopes southeast at about 9 ft/mi, with the altitude of the top of the unit ranging from about 75 ft below sea level at Deal Island to about 190 ft below sea level near Wellington (fig. 11). Figure 12 shows the thickness of the Manokin aquifer, which ranges from zero, where the aquifer becomes finer grained, to more than 80 ft in the northeastern corner of the county.

Most domestic wells in Somerset County withdraw water from the Manokin aquifer. The aquifer also serves as the source of water for the town of Princess Anne and the Eastern Correctional Institution. In addition, several poultry-raising operations and a plywood-manufacturing plant withdraw water from the Manokin aquifer. South of the town of Westover, however, chloride concentrations in the aquifer exceed the 250-mg/L SMCL of the U.S. Environmental Protection Agency (USEPA) (1986b), and the Manokin aquifer usually is not used as a source of potable water in this area.

### Well yield and specific capacity

Reported yields for 269 wells in the Manokin aquifer range from 2 to 350 gal/min, with a median of 20 gal/min. Reported specific capacities for 198 wells range from 0.1 to 75

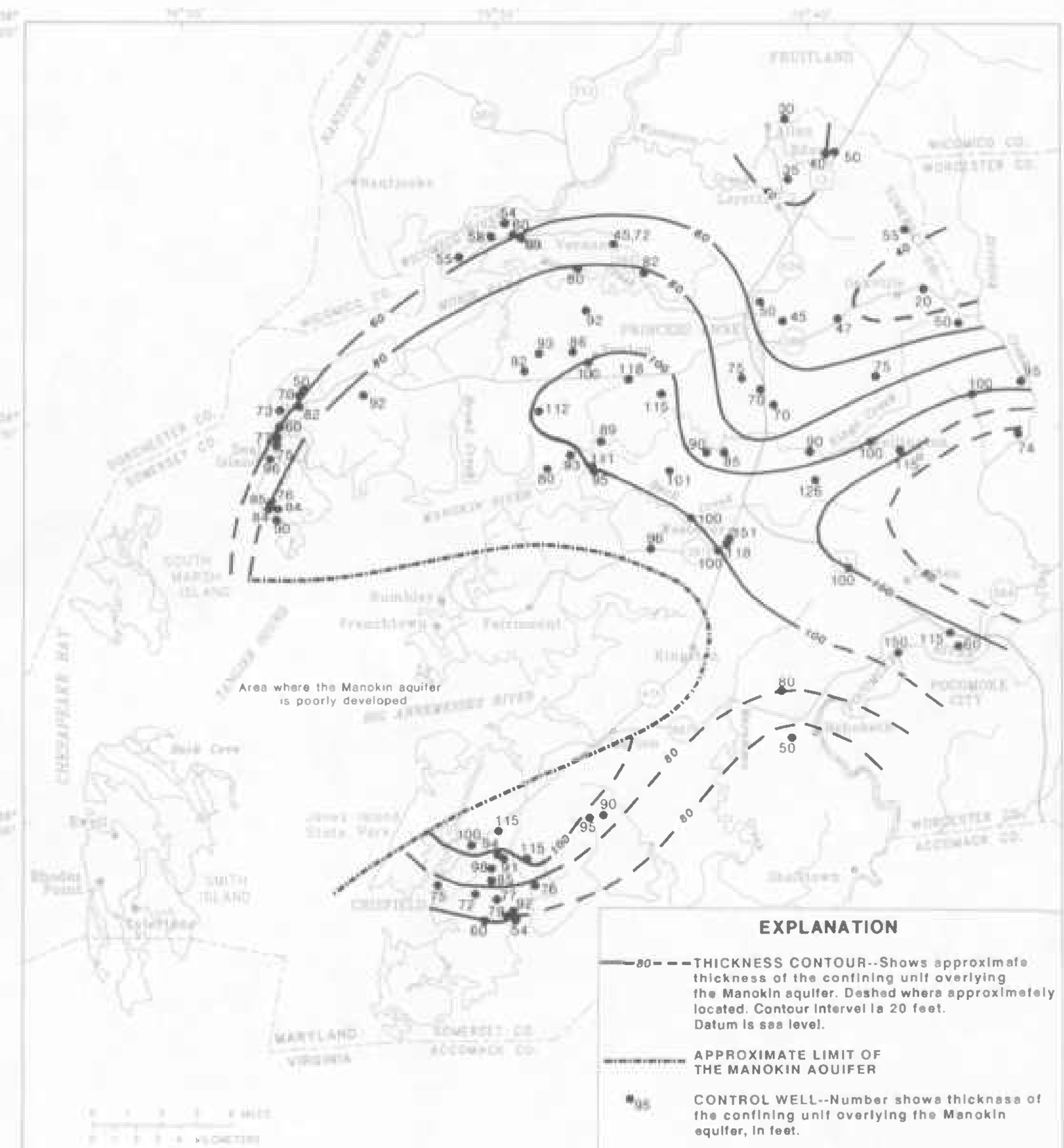



Figure 10.— Thickness of the confining unit overlying the Manokin aquifer.

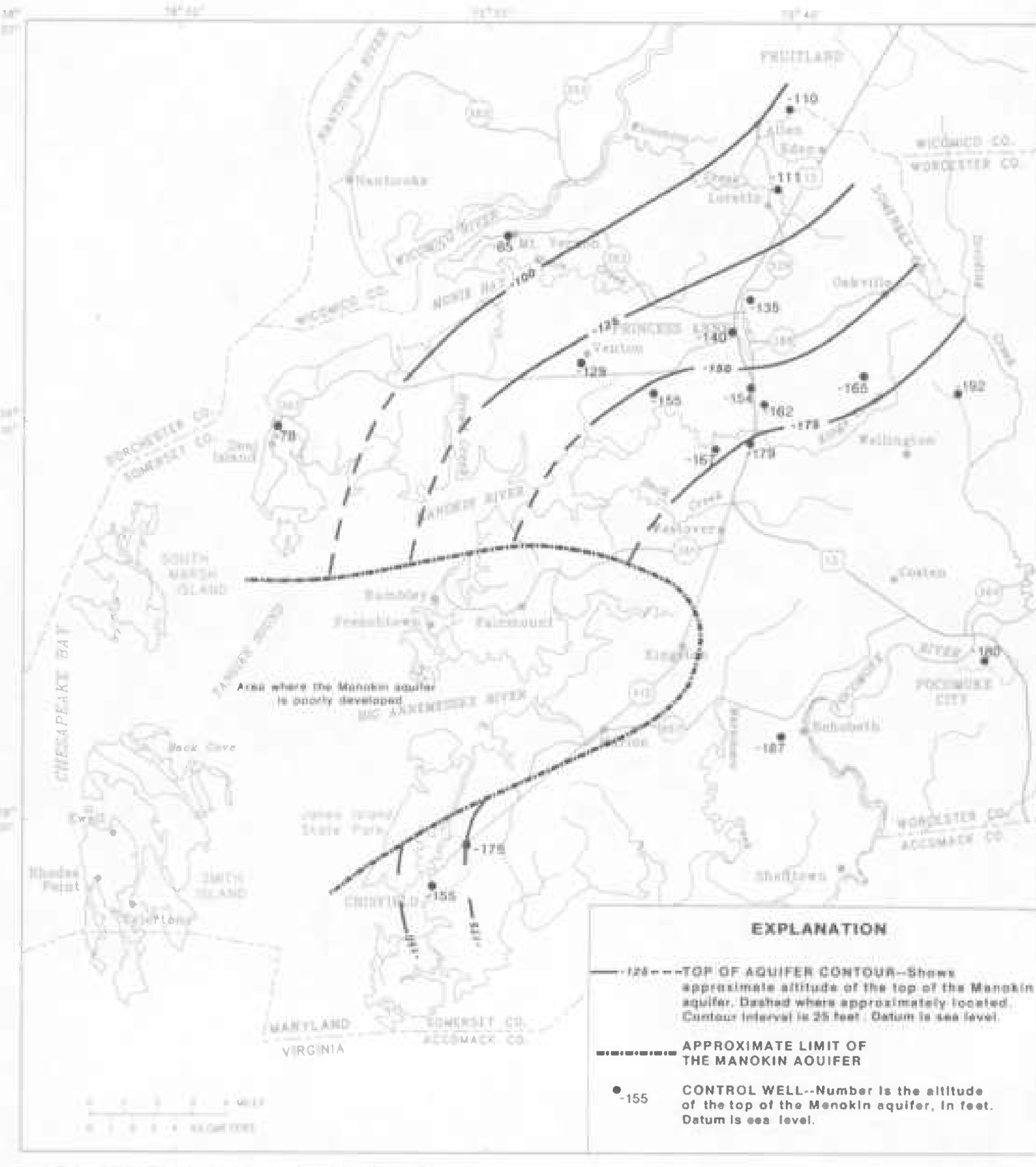



Figure 11.-- Altitude of the top of the Manokin aquifer.

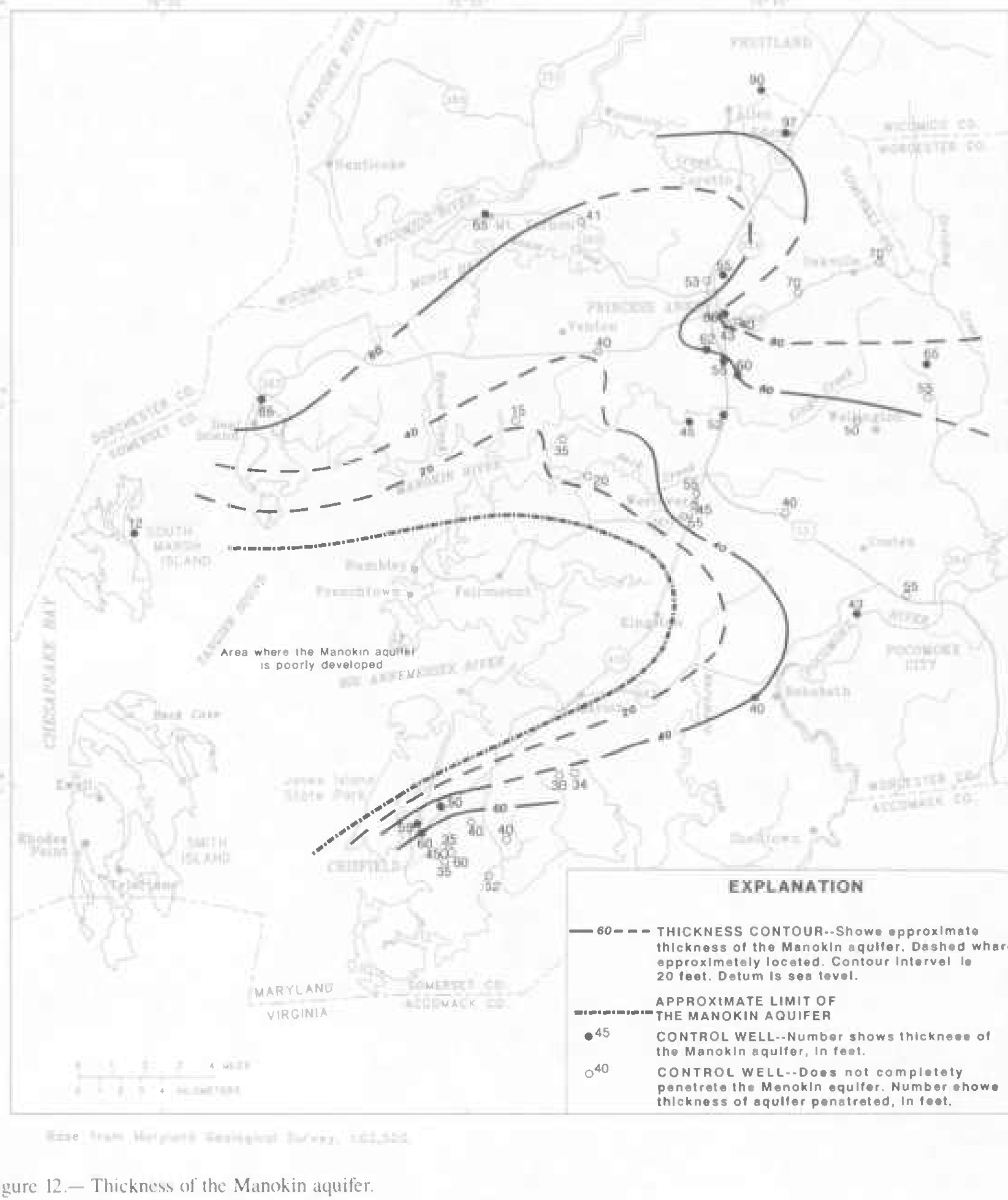



Figure 12.— Thickness of the Manokin aquifer.

(gal/min)/ft, with a median specific capacity of 5.2 (gal/min)/ft. No areal trends are evident in the distribution of well yield or specific capacity.

## Hydraulic properties

The hydraulic characteristics of the Manokin aquifer are not well known throughout the county, but four multiple-well aquifer tests and a 48-hour, single-well aquifer test (at well SO Be 55) were performed in the Princess Anne area. Table 5 includes transmissivities, hydraulic conductivities, and storage coefficients estimated from the Manokin test data. Transmissivity ranges from 500 to 940 ft²/d. Hydraulic conductivity, which is determined by dividing transmissivity by aquifer thickness, ranges from 10.9 to 14.7 ft/d (feet per day) and has an average value of 13.2 ft/d. Storage coefficients calculated from the four multiple-well aquifer tests range from 0.0002 to 0.001.

Sediments of the Manokin aquifer appear to be relatively uniform with respect to grain size and sorting. Most driller's logs describe the aquifer as fine- or medium-grained sand, with some silty sand. Therefore, as a first approximation of the areal distribution of transmissivity, the average hydraulic conductivity (13.2 ft/d) was multiplied by aquifer thickness as determined from figure 12.

These initial values were modified during calibration of the digital model of the Manokin aquifer, as described later in this report. Figure 13 shows the modified transmissivity distribution. The largest values of transmissivity are in the northeastern corner of the county where values may exceed 1,000 ft²/d. Transmissivity decreases to the south and east to about 200 ft²/d in the vicinity of Crisfield. North of Crisfield, and encompassing the towns

TABLE 5
TRANSMISSIVITIES, HYDRAULIC CONDUCTIVITIES, AND STORAGE COEFFICIENTS FOR AQUIFERS, AS DETERMINED FROM AQUIFER TESTS
[gal/min = gallons per minute; ft=feet; ft²/d = feet squared per day; ft/d = feet per day; -- = no data]

| Pumped well | Date and duration of test | Pumping rate (gal/min) | Observation wells and distance from pumping well (ft) | | Aquifer or aquifer system | Analysis by | Method of analysis | Transmissivity (ft²/d) | Hydraulic conductivity (ft/d) | Storage coefficient |
|---|---|---|---|---|---|---|---|---|---|---|
| SO Be 51 | 4/12/54<br>17 days | 115 | SO Be 42 | 1,300 | Manokin | Rasmussen and Slaughter | -- | 940 | 10.9 | 0.0002 |
| SO Be 55 | 6/11/85<br>48 hours | 128 | -- | -- | Manokin | W. B. Werkheiser | Cooper and Jacob semi-log | 920 | 14.2 | -- |
| SO Be 56 | 5/29/85<br>24 hours | 503 | SO Be 110 | 10 | Manokin | W. H. Werkheiser | Hantush-Jacob leaky artesian | 770 | 13.1 | .001 |
| SO Cd 41 | 5/28/79<br>24 hours | 100 | -- | -- | Potomac | W. H. Werkheiser | Cooper and Jacob semi-log | 1,280 | -- | -- |
| SO Ce 44 | 7/ 1/85<br>48 hours | 180 | SO Ce 47<br>SO Ce 49 | 600<br>2,500 | Manokin | W. H. Werkheiser | Hantush-Jacob leaky artesian | 760<br>740 | 14.9<br>14.5 | .0002 |
| SO Ce 48 | 5/28/85<br>48 hours | 125 | SO Ce 51 | 600 | Manokin | W. H. Werkheiser | Hantush-Jacob leaky artesian | 500 | 13.3 | .0002 |
| SO Dc 4 | 12/21/70<br>24 hours | 117 | SO Dc 3 | 200 | Potomac | I. H. Kantrowitz | Theis non-leaky artesian | 2,140 | -- | .0002 |
| SO Ec 49 | 7/17/84<br>24 hours | 800 | -- | -- | Paleocene and Potomac | W. H. Werkheiser | Cooper and Jacob semi-log | 1,050 | -- | -- |

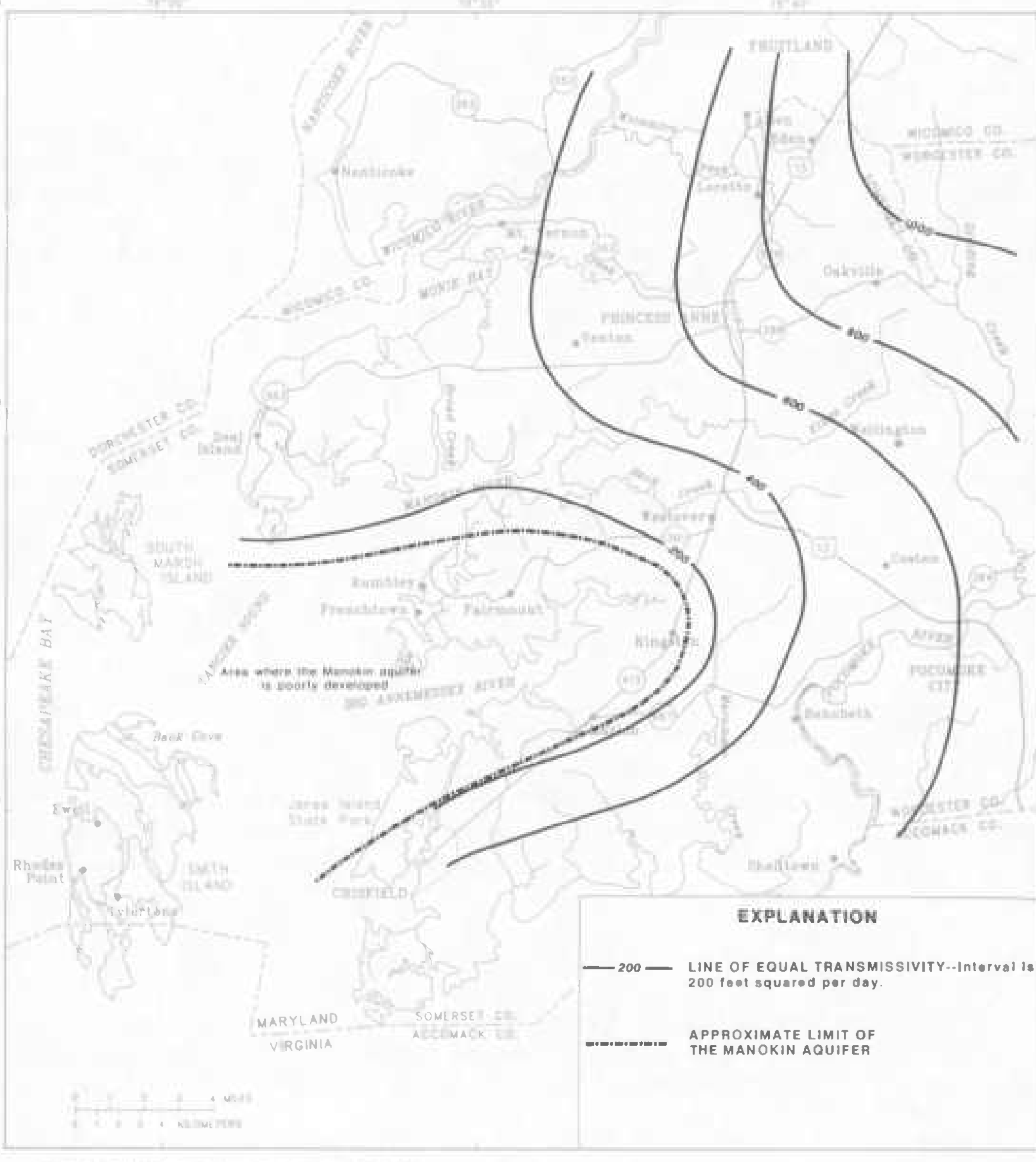



Figure 13.— Transmissivity of the Manokin aquifer used in the model of the Princess Anne area.

of Rumbley and Kingston, is an area where the sediments that are equivalent to the Manokin aquifer consist primarily of very fine sand and silt and no longer function as an aquifer. In this area the primary source of water is either the overlying Pocomoke aquifer or the deeper Paleocene and Potomac aquifer systems.

### Water levels

During the early 1950's, before the Manokin aquifer was developed extensively, water-level altitudes in the subcrop of the Manokin aquifer were highest near the Delaware-Maryland border at Delmar (Rasmussen and Slaughter, 1955, p. 99) and were probably near sea level beneath the Chesapeake Bay. Ground-water levels for the aquifer in Somerset County ranged from about 20 ft above sea level near Eden to about 5 ft above sea level near Crisfield (Rasmussen and Slaughter, 1955, p. 208-238). This suggests that under pre-pumping conditions, the higher heads in the vicinity of the Delaware-Maryland border would cause ground water to flow across Somerset County from northeast to southwest and west.

In the 1950's, large-capacity wells were drilled in the Manokin aquifer for public and industrial water supply. Due to this pumping, water levels in the aquifer have declined by as much as 45 ft. Figure 14 shows the altitude of water levels for the aquifer during April 14-16, 1987. The lowest altitudes, about 20 ft below sea level, are in the vicinity of Princess Anne where several large-capacity wells are located. The highest altitudes, about 10 ft above sea level, are in the northeastern corner of the county.

The water-level declines in the vicinity of Princess Anne have had several effects on the ground-water-flow system. First, the reduction in head in the Manokin aquifer has increased the leakage of water from overlying and underlying units into the aquifer. Second, ground-water-flow directions have changed from a regional (northeast to southwest) to a local pattern, with ground water moving radially toward the pumping centers at Princess Anne. There is concern that pumpage in the Princess Anne area will cause movement of the high-chloride (chloride concentration in excess of 250 mg/L) water south of Westover. Figure 14 shows that water levels in the Manokin aquifer throughout most of the county are below sea level, with the deepest water levels occurring near Princess Anne. Therefore, the potential exists for the high-chloride water south of Westover to migrate toward Princess Anne. In addition to migration of high-chloride water from the southern part of the county, migration of high-chloride water from west of the county also is possible. The Manokin aquifer subcrops beneath the Chesapeake Bay to the west of Somerset County. With the change in ground-water-flow directions associated with ground-water withdrawals near Princess Anne, brackish water from the Chesapeake Bay could intrude into the aquifer and migrate toward the pumping centers at Princess Anne.

Water levels shown in figure 14, when compared with the top of the aquifer shown in figure 11, suggest that withdrawals from the Manokin aquifer could be increased without dewatering the aquifer. However, the increased hydraulic gradient associated with increased pumping would result in more rapid migration of high-chloride water toward pumping centers. The effects of increased withdrawals from the Manokin aquifer will be more fully addressed in later sections.

Figure 15 depicts water-level fluctuations in observation well SO Be 42. This well is located near several pumped wells at Princess Anne that cycle on and off throughout the day, causing water levels in the observation well to vary substantially in a short time period.

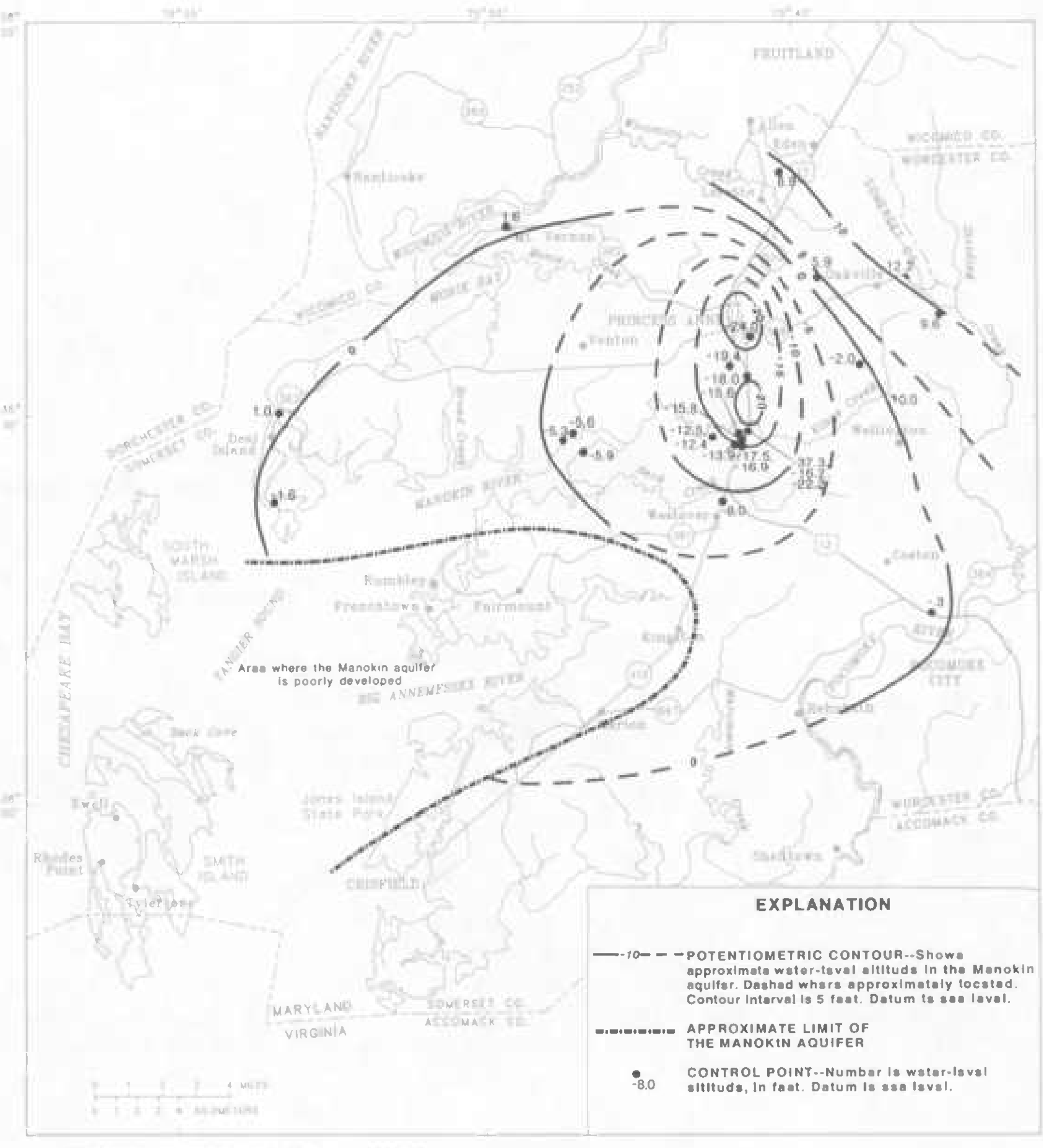



Figure 14.— Water-level altitudes in the Manokin aquifer, April 14-16, 1987.

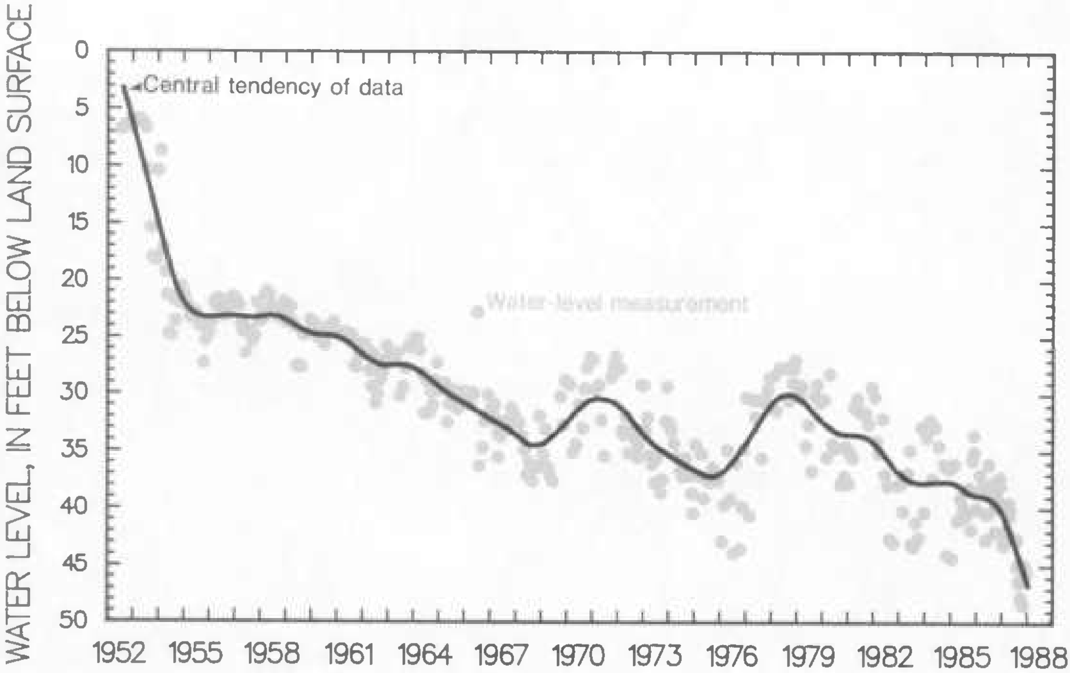



Figure 15.— Water levels in observation well SO Be 42, 1952-88 (well location shown on quadrangle map Be at end of report).

Therefore, the water levels shown in figure 15, which were measured at about 6-week intervals, show considerable scatter. The line drawn through the data shows the central tendency of the data and was obtained by using a locally weighted, scatterplot smoothing routine. The sharpest water-level decline was during 1953-55, in response to the initial pumping of the high-capacity wells at Princess Anne. In the late 1950's as the ground-water system adjusted to this pumpage, water levels began to stabilize at about 23 ft below land surface. During the 1960's water levels again started to decline, probably in response to increased ground-water withdrawals. Throughout the 1970's and early 1980's water levels oscillated, possibly due to changes in recharge and total ground-water pumpage. The oscillations also may have resulted, in part, from the redistribution of ground-water pumpage that occurred when additional production wells were installed in 1967 and 1976. In 1988, water levels again declined as ground-water withdrawals increased at Princess Anne and the Eastern Correctional Institution.

## Confining Unit between the Manokin and Choptank Aquifers

A confining unit composed of gray clay and silty clay (St. Marys Formation) separates the Manokin aquifer from the underlying Choptank aquifer (Rasmussen and Slaughter, 1955, p. 93). Although data are inadequate to define the extent of this unit in Somerset County, in those wells that fully penetrate the St. Marys Formation, the thickness ranges from 70 ft on Deal Island to 190 ft near Rehobeth (pls. 1-4). The unit is present at every location where wells have been drilled deep enough to encounter it. Therefore, it appears that it is laterally continuous in Somerset County. The thickness, fine-grained nature, and lateral extent of the unit probably allow little water to exchange between the Manokin aquifer and the Choptank aquifer.

## Choptank Aquifer

The Choptank aquifer, which consists of the Choptank Formation, is composed of gray, coarse- to fine-grained sand, with shell beds and lenses of gray clay (Rasmussen and Slaughter, 1955, p. 86). The top of the aquifer occurs at about 225 ft below sea level on Smith Island, and dips to the east at about 10 ft/mi (fig. 16). Based on limited data, the aquifer appears to thicken from about 70 ft at Smith Island eastward to 150 ft at Rehobeth (pls. 1-4).

Although the aquifer is capable of supplying adequate quantities of water to wells, chloride concentrations in excess of 900 mg/L and dissolved solids in excess of 3,000 mg/L preclude its use as a source of water for most purposes. Rasmussen and Slaughter (1955, p. 208-238) report several wells finished in the Choptank aquifer at Deal Island and Crisfield, but presently no wells in Somerset County are known to produce water from the aquifer. Rasmussen and Slaughter (1955, p. 89) suggest that the quality of water in the aquifer improves toward the subcrop area, which is about 30 mi north of Somerset County.

## Confining Unit between the Choptank and Piney Point Aquifers

A confining unit consisting of the Calvert Formation separates the Choptank and Piney Point aquifers. The confining unit in Somerset County consists predominantly of blue, green, and brown clay, but may contain local sand interbeds (Rasmussen and Slaughter, 1955, p. 83-85). In Wicomico County, the sands in the Calvert Formation become extensive enough to be termed the Nanticoke aquifer by Rasmussen and Slaughter (1955, p. 85), but in Somerset County the entire Calvert Formation appears to be a confining unit. The unit appears to be laterally continuous throughout Somerset County and is up to 400 ft thick (pls. 1-4). The fine-grained nature, lateral continuity, and thickness of the unit probably allow little water to exchange between the Choptank aquifer and the Piney Point aquifer.

## Piney Point Aquifer

### Description

The Piney Point aquifer is in the Piney Point Formation and is predominantly green, fine- to medium-grained glauconitic sand and gray, coarse-grained quartzose sand in a greenish-gray clay matrix (Hansen, 1967, p. 3). It occurs at depths ranging from 580 ft below land surface on Deal Island to 950 ft below land surface at Rehobeth (pls. 1-4). At Crisfield, the Piney Point is encountered at a depth of about 730 ft (pl. 4). The thickness of the aquifer ranges from 50 ft at Rehobeth to 85 ft on Smith Island (pls. 1-4). The characteristics of the Piney Point aquifer are not known in the northern part of the county, as no wells have been

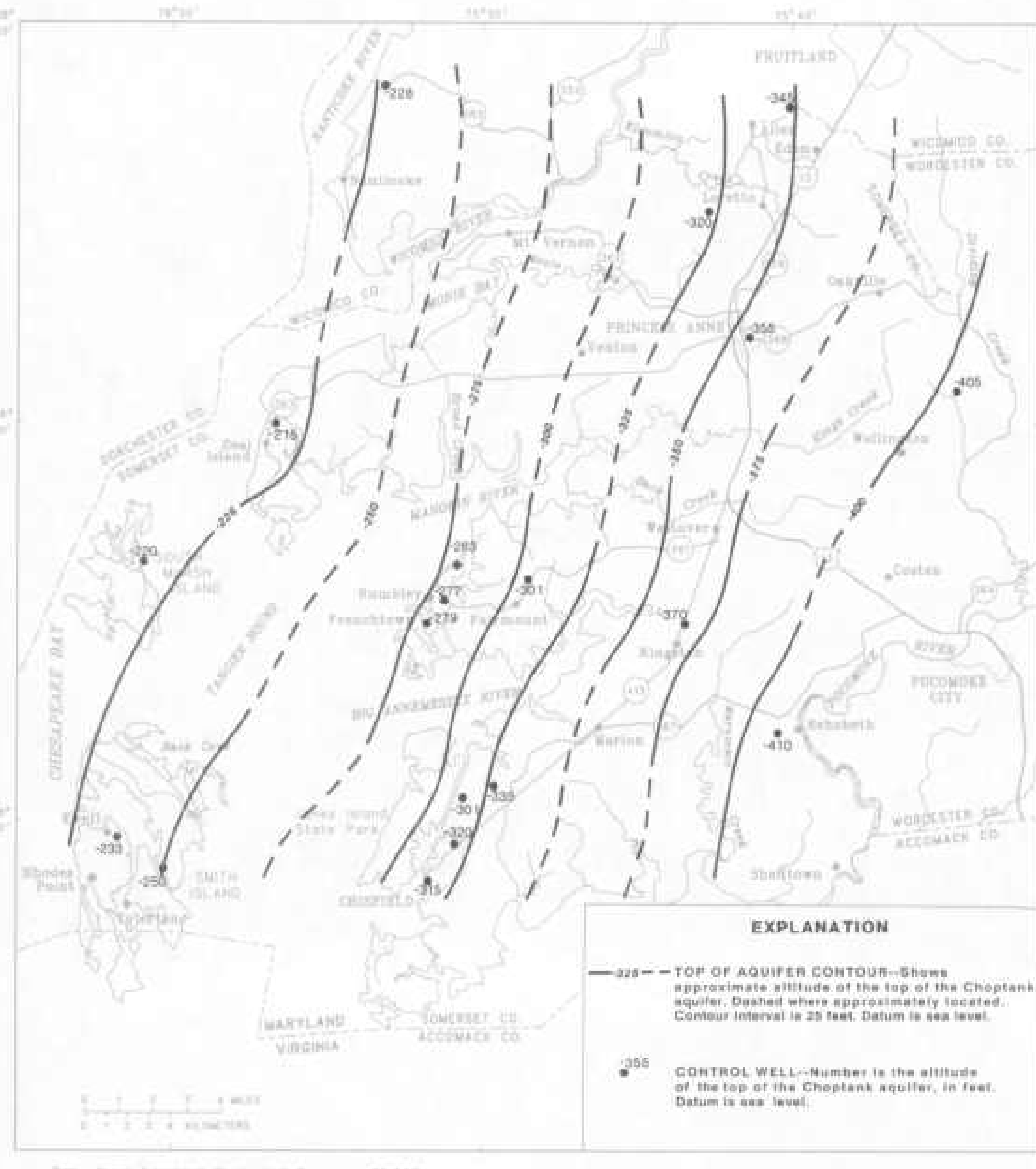



Figure 16.— Altitude of the top of the Choptank aquifer.

drilled in the unit. A single chemical analysis (from well SO Bb 19) collected during this investigation indicates that water in the aquifer may contain dissolved solids in excess of 1,000 mg/L, which may make the aquifer undesirable as a source of potable water. A municipal well in Crisfield, SO Ec 4, derives water from the Piney Point and deeper aquifers so that the more mineralized water from the Piney Point aquifer is mixed with the less mineralized water from the other aquifers. This well currently is not in use.

#### Well yield

The water-producing capabilities of the Piney Point aquifer are virtually unknown, as reported well yields are available for only three wells. The reported yields are 4, 10, and 30 gal/min. Rasmussen and Slaughter (1955, p. 79) report that the aquifer is absent east of Somerset County, apparently grading into a fine-grained unit. Therefore, the water-yielding potential of the Piney Point aquifer may be lower in the eastern part of the county.

#### Water levels

Water levels in the Piney Point aquifer are unknown as there are no observation wells screened solely in the aquifer. Rasmussen and Slaughter (1955, p. 210, 217) report water levels in two wells, SO Bb 1 and SO Cc 1, that were 5 ft and 7 ft above sea level, respectively. As the aquifer is unstressed in Somerset County, 1988 water levels are likely to be similar to those of the early 1950's. Observation well SO Ec 4 is screened in the Piney Point aquifer as well as deeper aquifers. The water level in this well varies from about 12 ft to 18 ft below land surface (fig. 20). This indicates that the Piney Point aquifer does not greatly influence the water level in the well. This may be because the screen is clogged in the vicinity of the aquifer, or it may indicate that the transmissivity of the Piney Point aquifer at this location is lower than the transmissivity of the other aquifers in which the well is screened.

### Confining Unit between the Piney Point Aquifer and Paleocene Aquifer System

A confining unit of gray, green, or black sand and clay separates the Piney Point aquifer from the underlying Paleocene aquifer system. In this report the confining unit is considered part of the Piney Point Formation, although other investigators have placed these sediments in the Eocene Nanjemoy Formation (Hansen, 1978, fig. 10), or have considered them as part of the Paleocene Series (Rasmussen and Slaughter, 1955, p. 311; Hansen, 1967, p. 11). Thickness of the unit ranges from 10 to 25 ft (pls. 1, 3-4). Depth to the top of the unit ranges from 690 ft below land surface at Deal Island to 1,000 ft below land surface at Rehobeth (pl. 4). The characteristics of the confining unit in the northern part of the county are not known.

### Paleocene Aquifer System

#### Description

Underlying the Piney Point aquifer is a series of aquifers and confining units collectively called the Paleocene aquifer system in this report, following the usage of the Maryland Geological Survey. The aquifers generally consist of fine- to medium-grained glauconitic and quartzose sand, whereas, the confining units are generally composed of gray to green clay and sandy clay (Hansen, 1967, p. 3). The aquifer system is encountered at depths of about 720 ft on Smith Island and about 800 ft at Crisfield (pl. 4). Total thickness of the system is about 90 ft on Smith Island and about 175 ft near Crisfield (pl. 4). In those wells that obtain water from the Paleocene aquifer system, screens are usually set in the lower sands of the aquifer system. The sands in the Paleocene aquifer system appear to thin or change facies to the north and east of Crisfield, causing the Paleocene sediments to act as a confining unit in other areas of the lower Eastern Shore (Rasmussen and Slaughter, 1955, p. 74).

In 1988, the city of Crisfield was the only municipality using water from the Paleocene aquifer system. Municipal wells SO Ec 1 and SO Ec 2 are screened solely in the aquifer system and three others—SO Ec 4, SO Ec 42, and SO Ec 49—are screened in multiple aquifers including the Paleocene aquifer system. On Smith Island, and at the towns of Rumbley, Frenchtown, and Fairmount, the Paleocene aquifer system is bypassed, and wells are screened in the more productive sands of the Potomac aquifer system.

### Well yield and specific capacity

Because few wells are screened solely in the Paleocene aquifer system, little is known about its water-yielding capabilities. The specific capacity of wells SO Ec 1 and SO Ec 2 are 1.8 and 1.9 (gal/min)/ft, respectively. The yield of well SO Ec 2 was reported to be 300 gal/min during the specific-capacity test. These wells are adjacent to each other and both are finished in the lower sands of the aquifer system. Therefore, these specific-capacity values may not be representative of the entire aquifer system.

### Hydraulic properties

No aquifer-test data are available for wells screened only in the Paleocene aquifer system. A single-well aquifer test was conducted on well SO Ec 49, which is screened in two lower sands in the Paleocene aquifer system and the three upper sands of the Potomac aquifer system (pl. 4). The composite transmissivity calculated for the screened sands of these two aquifer systems is 1,050 $ft^2/d$ (table 5).

### Water levels

Water levels in the Paleocene aquifer system are not known, because no observation well is screened entirely in the system. Rasmussen and Slaughter (1955, p. 59) report static water levels in newly drilled wells in 1950 to be above land surface. In 1986, the water level in well SO Ec 42, screened in both the Paleocene aquifer system and the underlying Potomac aquifer system, was 2 ft below land surface.

The fact that available drawdown in the aquifer system is about 800 ft suggests that greater yields should be possible without dewatering the aquifers. However, because the aquifer system becomes finer grained between Crisfield and Salisbury, it is not known if the Paleocene aquifer system could sustain significantly larger ground-water withdrawals without producing adverse effects, such as excessive water-level declines in the aquifer.

## Potomac Aquifer System

### Description

The deepest hydrogeologic units in Somerset County that produce water of acceptable quality are in the aquifer system of the Potomac Group. The aquifer system, as reported in descriptions of well cuttings, consists of white, yellow, and gray, fine- to coarse-grained sand intercalated with gray, green, and red clay (Hansen, 1967, p. 11). The upper sand units in the aquifer system were identified as belonging to the Magothy Formation by Rasmussen and Slaughter (1955, p. 53-55). Later work by Hansen (1978) suggests that marine Upper Cretaceous beds are absent in Somerset County in the Crisfield area, and that the strata underlying the Paleocene aquifer system are part of the Potomac Group.

The sediments of the Potomac Group are of deltaic to fluvial origin (Rasmussen and Slaughter, 1955, p. 45; Hansen, 1982, p. 3). As such, individual beds of sand, silt, and clay may have restricted areal and vertical extent. Because of this, correlation of individual beds over more than a few miles is difficult.

The top of the Potomac aquifer system is encountered at about 820 ft below land surface on Smith Island and at about 1,000 ft below land surface near Crisfield (pl. 4). A geothermal test well, SO Dd 47, was drilled through the Potomac Group sediments and encountered basement rock at a depth of about 4,225 ft (Hansen, 1982, p. 12). Although the data from this well indicate that the Potomac Group is over 3,000 ft thick at Crisfield, only the sands in the upper several hundred feet of the unit are thought to contain potable water. The deepest aquifer yielding potable water occurs at a depth of 1,295 ft in SO Ec 49 (pl. 4). The multi-point electric log for SO Dd 47 (fig. 17) suggests that one or two deeper aquifers may contain potable water (H.J. Hansen, Maryland Geological Survey, written commun., 1988). Electrical resistivity of an aquifer is inversely proportional to the dissolved-solids content of water in an aquifer (Keys and MacCary, 1983, p. 42). The sand that occurs from about 1,410 to 1,460 ft in SO Dd 47 has a resistivity of about 14 ohm-meters (fig. 17), which is slightly less than the resistivities of the shallower freshwater-producing aquifers (1,050 to 1,200 ft) in the Potomac aquifer system. Assuming that conditions are similar in the aquifers, the dissolved-solids concentration of the deeper sand (1,410 to 1,460 ft) should be comparable to the concentrations (600 to 750 mg/L) found in the upper sands. The sand that occurs from 1,510 to 1,540 ft has about one-half the resistivity of the upper sands, suggesting a greater concentration of dissolved solids.

The primary purpose for drilling well SO Dd 47 was to test the geothermal potential of the Somerset County area. Figure 18 is a temperature log of SO Dd 47. The geothermal gradient in the Crisfield area is about 2.25 °F per 100 ft to a depth of about 1,000 ft. From 1,000 ft to the top of the basement the gradient is somewhat less at 1.75 °F per 100 ft.

East of Fairmount and Crisfield, the characteristics of the aquifer system are not well known but a test well, 66M23, was drilled in 1987 in the upper sands of the Potomac Group near Jenkins Bridge, Virginia, which is about 14 mi east of Crisfield. The well is 1,298 ft deep and is screened in the interval from 1,288 to 1,298 ft. The chloride concentration in the water from well 66M23 is 1,500 mg/L (A. Meng, U.S. Geological Survey, oral commun., 1988). If the sand of 1,288 to 1,298 ft is correlative with the freshwater-producing sands at Crisfield, it appears likely that water in the Potomac aquifer system becomes brackish east of Crisfield.

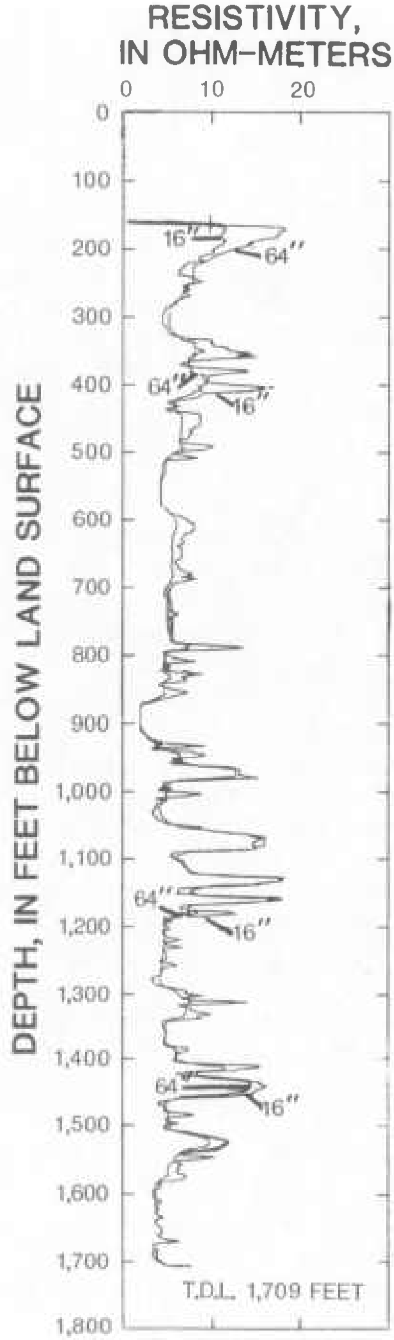



Figure 17.— Electric log for upper part of geothermal test well SO Dd 47 (well location shown on quadrangle map Dd at end of report).

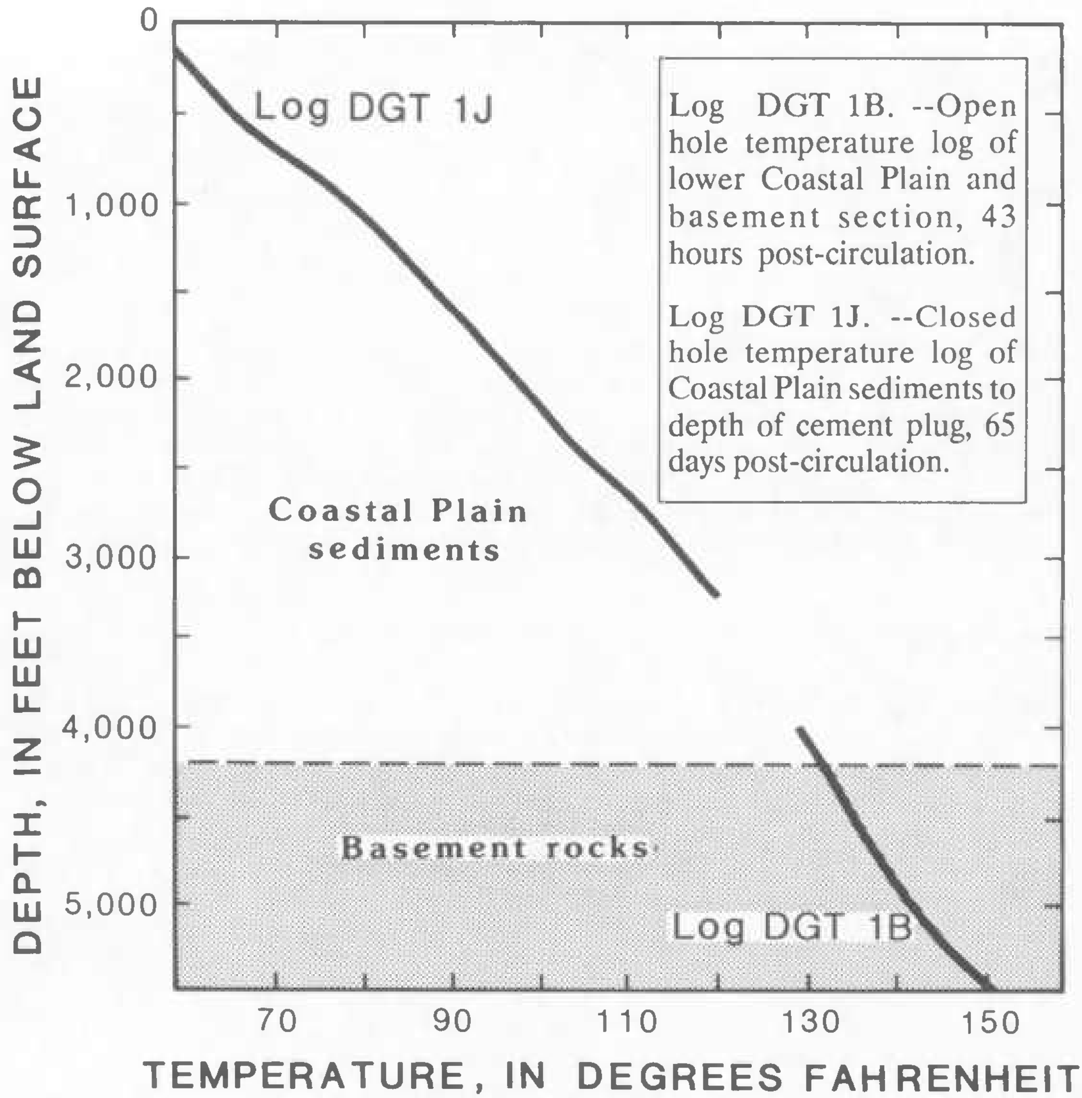



Figure 18.— Temperature profile of geothermal test well SO Dd 47 (modified from Dashevsky and McClung, 1979; well location shown on quadrangle map Dd at end of report).

The upper sands of the Potomac aquifer system are the most heavily used aquifer system for public water supply in the eastern part of the county. They produce water for municipal supplies at Crisfield, Rumbley, Frenchtown, Fairmount, and Smith Island.

## Well yield and specific capacity

Reported yields for 17 wells producing from the Potomac aquifer system range from 10 to 500 gal/min. The median well yield is 50 gal/min. In general, wells with lower reported yields are located on Smith Island and were drilled to supply small water systems. Wells on the mainland of Somerset County that produce from the Potomac aquifer system generally supply larger water systems and have larger reported yields. The range of reported yields for 10 of these mainland wells is from 30 to 500 gal/min, with a median value of 175 gal/min. Reported specific capacity for four wells on the mainland ranges from 1 to 7 (gal/min)/ft.

### Hydraulic properties

Because of the complex nature of the Potomac aquifer system, transmissivity values and storage coefficients calculated from aquifer tests may be representative of the tested aquifer only in the vicinity of the test site. In 1970, an aquifer test was performed at Janes Island State Park, using SO Dc 4 as the pumping well and SO Dc 3 as the observation well. Transmissivity of the aquifer (1,100-1,138 ft) is 2,140 $ft^2/d$ and the storage coefficient is 0.0002 (table 5). Transmissivity of the aquifer at 1,100-1,140 ft at Fairmount, in well SO Cd 41, is 1,280 $ft^2/d$, as estimated from a 24-hour, single-well aquifer test in 1979 (table 5).

### Water levels

Water levels in the Potomac aquifer system at Smith Island were reported as high as 15 ft above land surface in 1953 (Rasmussen and Slaughter, 1955, p. 54). Figure 19 shows mean daily water levels in well SO Dc 3 at Janes Island State Park during 1985-87. The well is influenced significantly by a nearby pumped well, but the mean daily water level varies from 8 to 12 ft below land surface. Figure 20 shows mean daily water levels during 1986-88 in observation well SO Ec 4, which is screened in the Piney Point aquifer, the Paleocene aquifer system, and the Potomac aquifer system. In this well, water levels are influenced by several production wells screened in the Paleocene and Potomac aquifer systems, rather than by any single well. The mean daily water level was about 18 ft below land surface from February 1986 through March 1987. In March 1987 water levels rose dramatically due to a temporary shutdown of a nearby production well. The generally upward trend from 1987 to 1988 may be due to changes in pumping rates in nearby wells.

Water levels in the Potomac aquifer system in the Crisfield area range from about 8 to 18 ft below land surface. This suggests that greater yields could be achieved from the aquifer system by utilizing more of the 950 ft of available drawdown. However, as with the Paleocene aquifer system, the areal extent and quality of water in the Potomac aquifer system are not well known east of the Crisfield area. It is possible that the aquifer system could not sustain withdrawals greatly in excess of present pumpage or that such pumpage may cause the migration of poor-quality water toward pumping centers.

## WATER QUALITY OF THE PRINCIPAL AQUIFERS

Ground-water quality in Somerset County differs considerably, both areally and with depth. Much of the county contains ground water suitable for drinking, but in some areas it is not possible to obtain water that meets drinking-water standards. Chemical analyses were performed for many of the inorganic constituents for which the USEPA has estab-

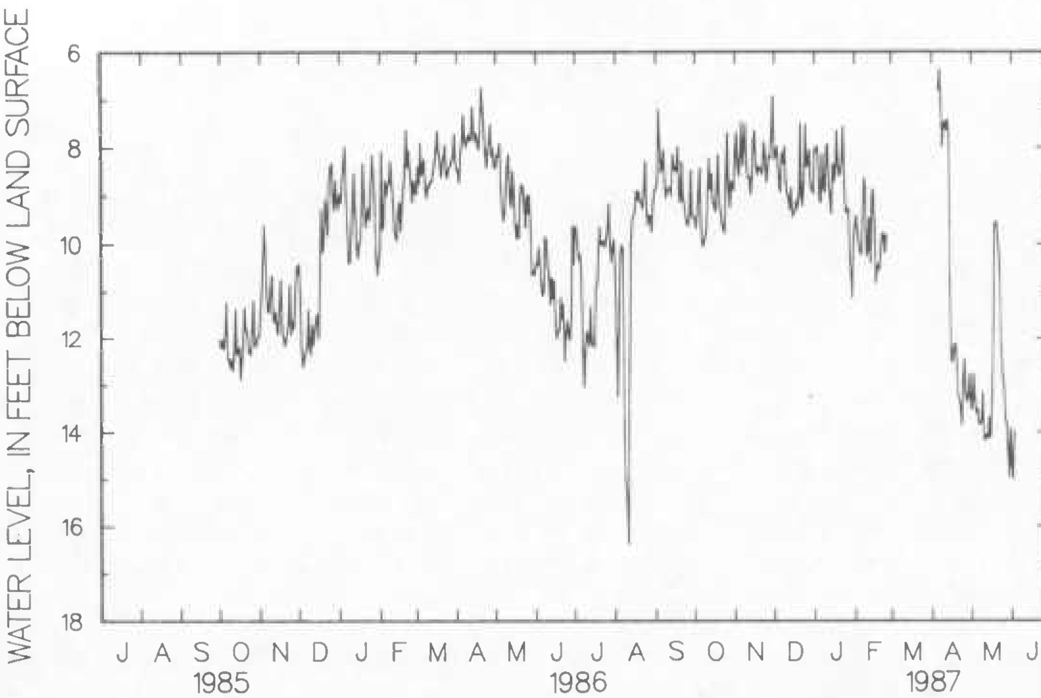



Figure 19.— Water levels in observation well SO Dc 3, 1985-87 (well location shown on quadrangle map Dc at end of report).

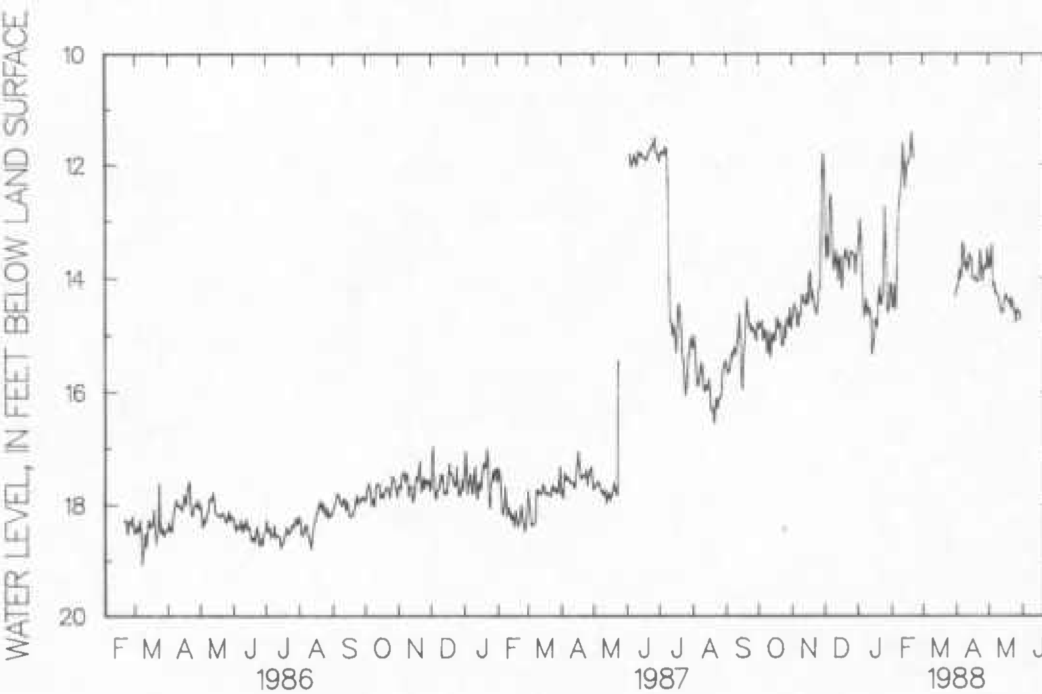



Figure 20.— Water levels in observation well SO Ec 4, 1986-88 (well location shown on quadrangle map Ec at end of report).

lished maximum contaminant levels (MCL). These constituents are listed in table 6. Maximum contaminant levels have been established for those substances that have an associated health risk, whereas secondary maximum contaminant levels (SMCL) are for those substances that primarily affect the aesthetic quality of water (U.S. Environmental Protection Agency, 1986a, 1986b).

Chemical analyses of water from 96 wells in Somerset County are listed in table 13 (at the end of report). Of those wells, 84 were sampled during this investigation and 17 were sampled prior to 1980. Because sample-collection and analytical techniques have changed substantially since 1980, only the recent analyses performed during this investigation (1986-87) are used to describe ground-water quality in Somerset County. Figure 21 shows the location of all sampled wells and the aquifer in which the wells are screened.

Little information exists concerning the quality of water in the Choptank and Piney Point aquifers. Few wells are screened in these aquifers, and no wells screened entirely in either aquifer are used to supply potable water. Rasmussen and Slaughter (1955, p. 202) report that chloride concentrations in the Choptank aquifer in the Crisfield area exceeded 939 mg/L. The quality of water in the Choptank aquifer in other parts of the county is not well known. A well near Loretto (SO Ae 21) was originally finished in the Choptank aquifer, but was eventually screened in the Manokin aquifer because chloride concentration in water from the Choptank aquifer was 518 mg/L (P. Pryor, Somerset County Health Department, oral commun., 1988). Water from well SO Bb 19, which is finished in the Piney Point aquifer, had acceptable chloride concentrations (180 mg/L), but contained dissolved solids in excess

TABLE 6
MAXIMUM CONTAMINANT LEVELS AND SECONDARY MAXIMUM CONTAMINANT LEVELS FOR SELECTED INORGANIC CONSTITUENTS IN DRINKING WATER
(from U.S. Environmental Protection Agency, 1986a, 1986b)
[mg/L = milligrams per liter; MCL = maximum contaminant level; SMCL = secondary maximum contaminant level]

| Constituent | Contaminant level (mg/L) | Type of standard |
|---|---|---|
| Barium | 1.00 | MCL |
| Cadmium | .01 | MCL |
| Chloride | 250 | SMCL |
| Copper | 1 | SMCL |
| Dissolved Solids (total residue) | 500 | SMCL |
| Fluoride | 4 | MCL |
| Fluoride | 2 | SMCL |
| Iron | .30 | SMCL |
| Lead | .05 | MCL |
| Manganese | .05 | SMCL |
| Nitrate (as N) | 10 | MCL |
| Sulfate | 250 | SMCL |
| Zinc | 5 | SMCL |

of 1,000 mg/L. Rasmussen and Slaughter (1955, p. 202) reported chloride concentrations in water from wells SO Bb 1 and SO Cc 1, which are finished in the Piney Point aquifer, of 250 and 562 mg/L, respectively.

The following discussion of ground-water quality addresses the principal aquifers and aquifer systems in the county; the surficial aquifer system, the Pocomoke aquifer, the Manokin aquifer, the Paleocene aquifer system, and the Potomac aquifer system. Discussion of the Paleocene and Potomac aquifer systems is combined in this section because several wells are screened in both aquifer systems, and water from the two aquifer systems may mix in the area of use.

## Surficial Aquifer System

The quality of water in the surficial aquifer system is known only from samples obtained from four wells. The dominant cations in water from wells SO Ce 83 and SO Cf 20 are sodium and iron, the dominant cations in water from SO Bf 20 are calcium and magnesium, and the dominant cation in SO Ae 17 is magnesium. Anion composition also differs in the four analyses. In water from wells SO Bf 20 and SO Cf 20, the dominant anions are sulfate and chloride, in water from well SO Ce 83 the major anions are sulfate and bicarbonate, and in water from SO Ae 17 the major anion is sulfate. Concentrations of dissolved solids range from 108 to 252 mg/L, below the SMCL of 500 mg/L (U.S. Environmental Protection Agency, 1986b). Water from the wells is soft to moderately hard and slightly acidic. The data available are not adequate to describe the quality of water in the surficial aquifer system. The complex geology and ground-water-flow field, and effects of land use, probably cause water quality in the aquifer system to differ considerably from place to place.

The most commonly reported water-quality problem associated with the surficial aquifer system is excessive concentrations of iron (P. Pryor, Somerset County Health Department, oral commun., 1988). Two of the four samples had concentrations of iron greater than the SMCL of 0.3 mg/L (U.S. Environmental Protection Agency, 1977b). Samples from wells SO Ce 83 and SO Cf 20 had iron concentrations of 48 mg/L and 27 mg/L, respectively. Iron is a common constituent in anoxic ground water in the surficial aquifers on the Delmarva Peninsula. In Delaware, Denver (1986) noted that dissolved iron is a significant component of shallow ground water associated with poorly drained soils and in water from wells screened near the base of the unconfined aquifer. Similar conditions probably exist in Somerset County. Iron also may be present in high concentrations in oxygenated water when unstable conditions exist in a well or aquifer. Boggess and Heidel (1968, p. 23) observed high concentrations of iron in oxygenated water in the Salisbury area and attributed these high concentrations to unstable conditions in the aquifer.

The surficial aquifer system also is susceptible to nitrate contamination. Nitrate concentrations in ground water that approach or exceed 10 mg/L as nitrogen usually are derived from nitrogen fertilizers or animal wastes. Records from the Somerset County Health Department show that elevated nitrogen concentrations occur chiefly in shallow ground water underlying well-drained soils. Figure 22 shows areas of the county underlain by well-drained soils. In these areas, shallow ground water in the vicinity of nitrogen sources may be susceptible to nitrate contamination.

The surficial aquifer system comprises both unconfined and confined aquifers. Unconfined aquifers generally are more susceptible to contamination from land-use practices than

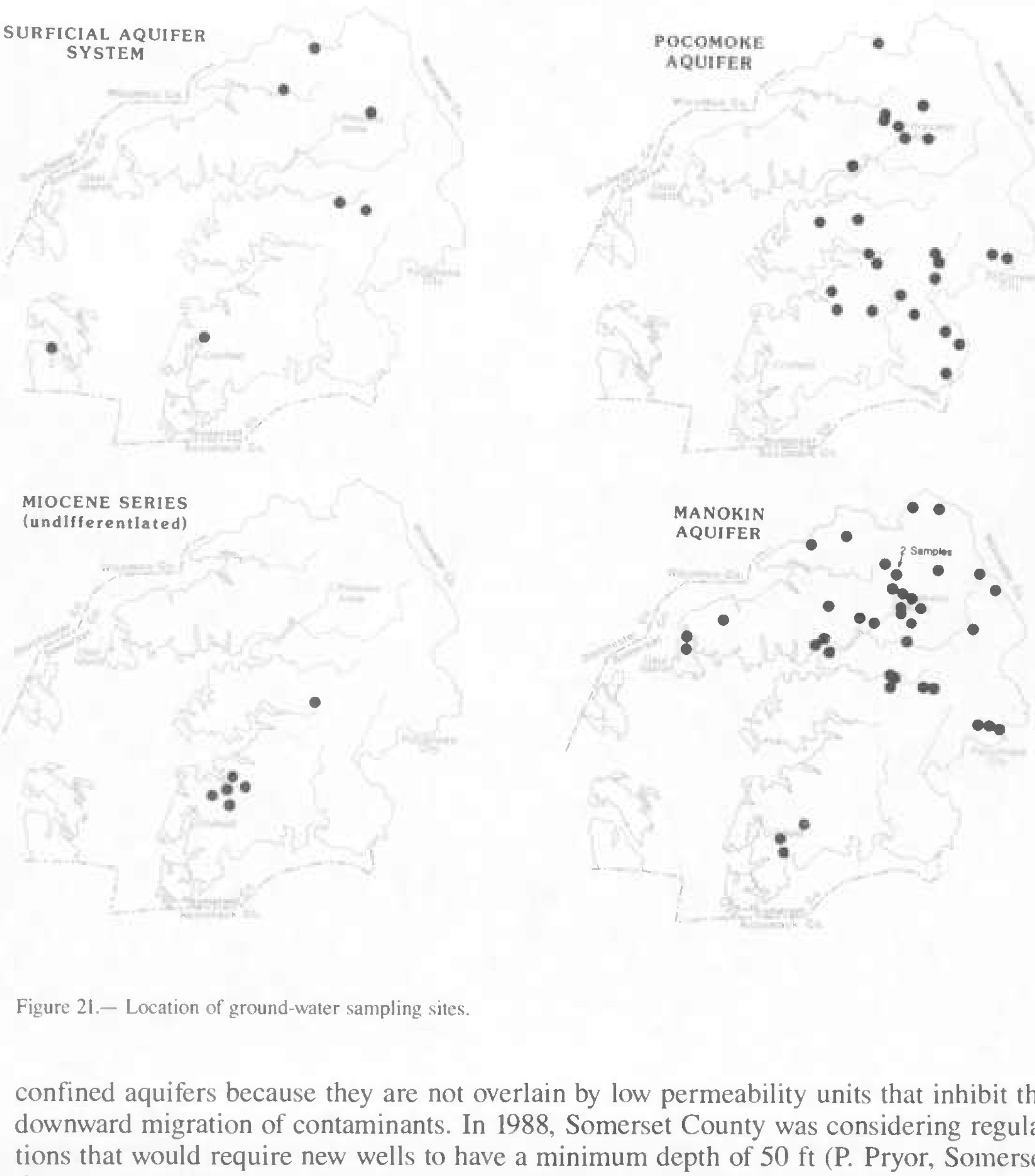



Figure 21.— Location of ground-water sampling sites.

confined aquifers because they are not overlain by low permeability units that inhibit the downward migration of contaminants. In 1988, Somerset County was considering regulations that would require new wells to have a minimum depth of 50 ft (P. Pryor, Somerset County Health Department, oral commun., 1988), because of the susceptibility of unconfined aquifers to contamination. Throughout much of the county the thickness of the surficial aquifer system is less than 50 ft; therefore, new wells drilled under the proposed regulation would be cased through the surficial aquifer system and be screened in deeper, confined aquifers.

## Pocomoke Aquifer

The quality of water in the Pocomoke aquifer is quite variable, as shown by the 24 chemical analyses in the trilinear diagram of figure 23. Overall, there appears to be little similar-

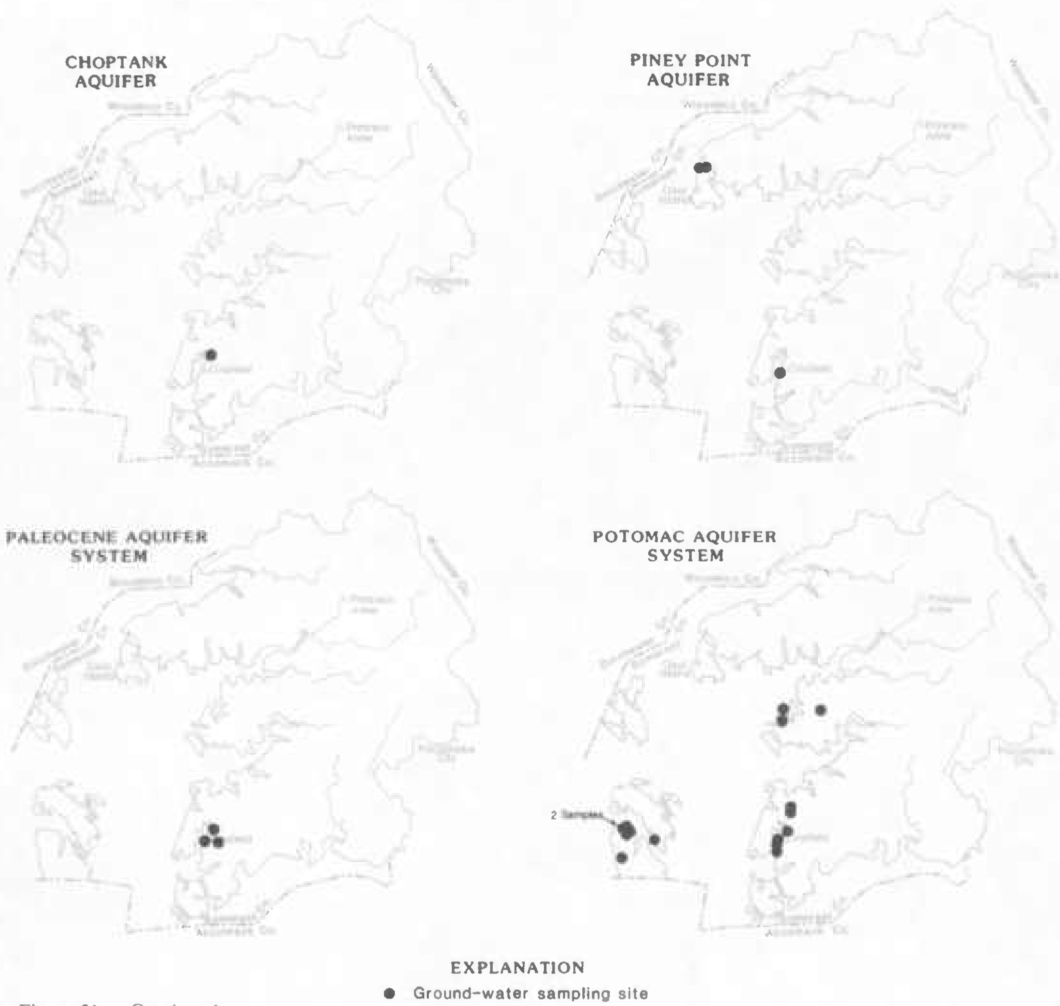



Figure 21.— Continued.

ity between the analyses. However, when the analyses are grouped by hydrogeologic characteristics, similarities can be seen. The Pocomoke aquifer in recharge areas is generally unconfined and water chemistry is influenced chiefly by the composition of precipitation, aquifer mineralogy, land use, soil type, and position in the ground-water-flow system. Therefore, chemical data for water from the recharge areas are scattered on figure 23. In contrast, analyses of water from the confined parts of the aquifer are grouped more closely on figure 23, probably due to the influence of mineral dissolution on water chemistry. The dominant cations in water from the confined part of the Pocomoke aquifer are calcium and sodium and the dominant anion is bicarbonate.

Plate 8 presents Stiff diagrams of major ions in 24 water samples from the Pocomoke aquifer. Generally, water is least mineralized in the recharge areas. The amount of dissolved constituents, especially calcium and bicarbonate, increases as water moves from subcrop areas to the confined parts of the aquifer. The increase in calcium and bicarbonate probably

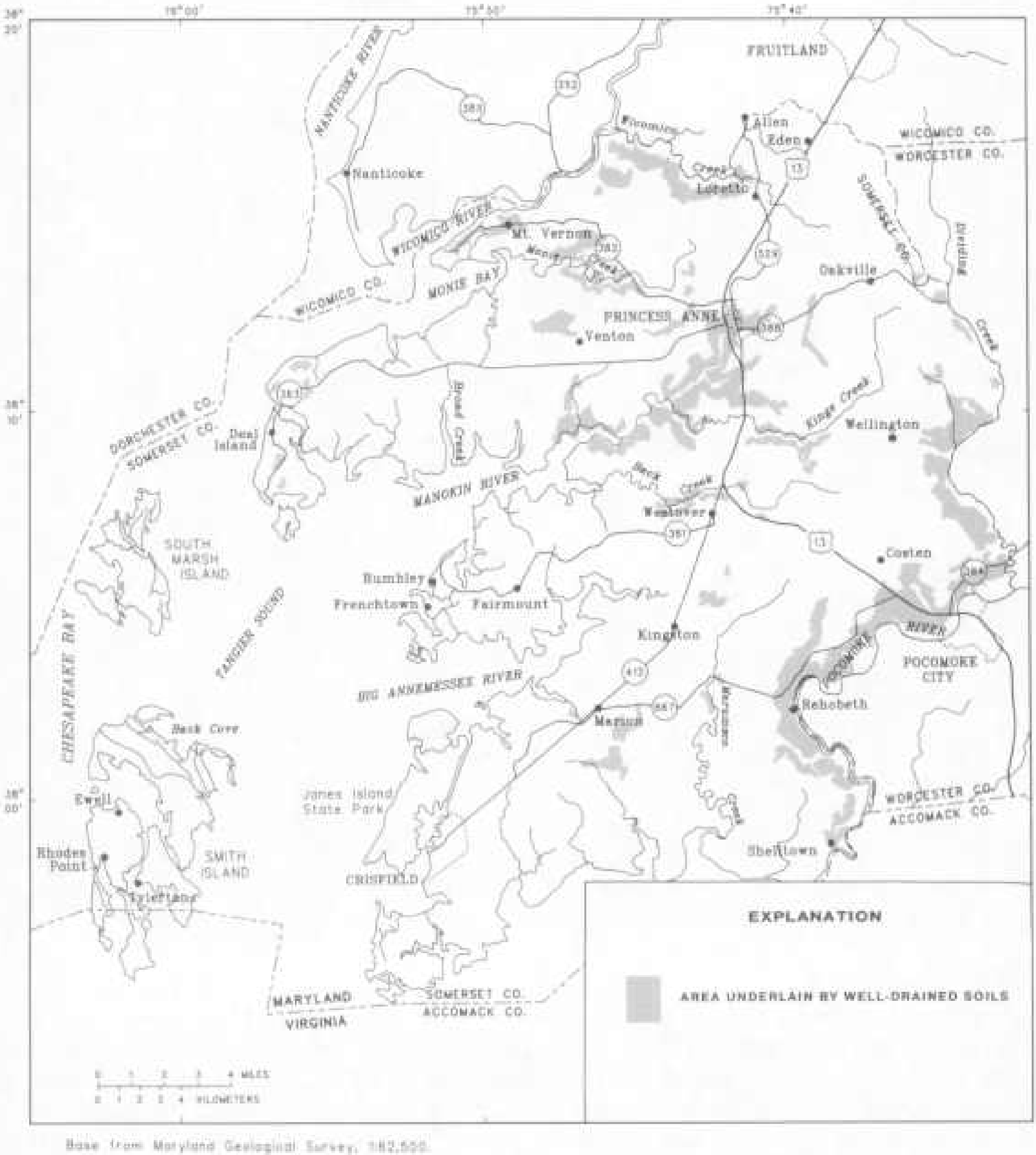



Figure 22.— Areas underlain by well-drained soils (adapted from Maryland Department of State Planning, 1974).


Figure 23.— Trilinear diagram for water from the Pocomoke aquifer.

is due to the dissolution of calcite or aragonite, which are the principal minerals dissolved by ground water on the Delmarva Peninsula (Cushing and others, 1973, p. 7).

Figure 24 shows box plots of the distribution of pH, hardness, and dissolved-solids concentration of water from the Pocomoke aquifer. The pH of water from recharge areas ranges from 4.5 to 6.4, and has a median of 5.1. In the confined part of the aquifer, pH of the water tends to be higher, ranging from 5.1 to 7.3, and has a median of 6.4 (fig. 24). Water from the confined part of the aquifer tends to be harder than water from recharge areas. Hardness of water from recharge areas ranges from 11 to 100 mg/L (as calcium carbonate) and has a median value of 33 mg/L. In the confined part of the aquifer hardness of the water ranges from 22 to 410 mg/L, and has a median value of 140 mg/L (fig. 24). Dissolved-solids concentrations of water from recharge areas range from 90 to 177 mg/L, and have a median of 131 mg/L. In water from the confined part of the aquifer, dissolved-solids concentrations range from 116 to 1,440 mg/L, and have a median of 287 mg/L (fig. 24). Overall, water in the recharge areas is more acidic, softer, and contains lower concentrations of dissolved solids than water in confined parts of the aquifer. These distributions likely reflect the longer flow paths in the confined system and the longer contact time between water and minerals of the aquifer matrix.

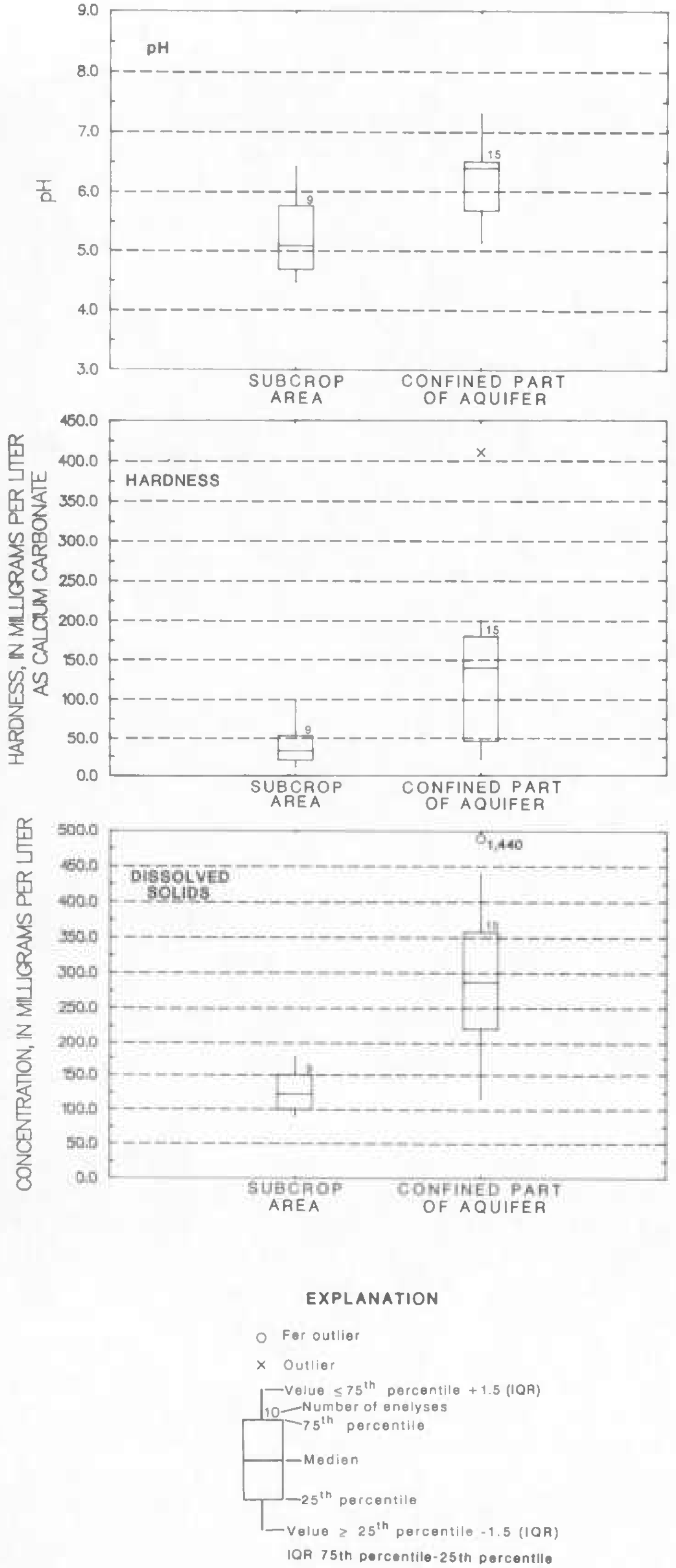



Figure 24.— pH, hardness, and dissolved-solids concentrations of water from the Pocomoke aquifer.

The most common quality problems in water from the Pocomoke aquifer are iron and manganese concentrations in excess of the SMCL's of 300 and 50 $\mu g/L$ (micrograms per liter), respectively (U.S. Environmental Protection Agency, 1986b). Iron concentrations range from 50 to 41,000 $\mu g/L$ with a median of 5,000 $\mu g/L$. Manganese concentrations range from 12 to 900 $\mu g/L$, with a median of 110 $\mu g/L$. Water from 22 of the 24 samples exceeds the SMCL for iron and 18 exceed the SMCL for manganese. One sample, from well SO Ef 6, exceeds the SMCL's for chloride and dissolved solids. This well is located near the Pocomoke River, and may be receiving brackish water from the river. Although no samples exceeded the primary drinking water standard for nitrate, water from two wells, SO Ae 16 and SO Df 14, contains nitrate concentrations of 6.3 and 6.5 mg/L respectively, which are greater than background (table 13, at end of report).

## Manokin Aquifer

Thirty-seven water-quality samples were collected from wells in the Manokin aquifer during this investigation. The distribution of major ions in the water samples is shown in figure 25. The dominant cation is sodium in every sample but one (from well SO Af 20), and the dominant anions are bicarbonate and chloride.

There is a marked areal difference in the chemical quality of water from the Manokin aquifer. North of Westover, the water is a sodium-bicarbonate type, dissolved solids range from 173 to 620 mg/L, and hardness ranges from 2 to 97 mg/L. South of Westover, the water is a sodium-chloride type, dissolved solids range from 807 to 1,860 mg/L, and hardness ranges from 76 to 260 mg/L. Stiff diagrams of the major ions in 16 water samples from the aquifer are presented in plate 9.

Back (1966, p. A38) proposed two explanations for sodium being the dominant cation in ground water in the Coastal Plain sediments of Maryland and Virginia: (1) saltwater underlies the area; and (2) cation exchange occurs between calcium in ground water and sodium in clay minerals. Ground water in the Manokin aquifer in Somerset County may obtain sodium by both mechanisms. In the northeastern corner of the county, chemical analysis of water from well SO Af 20 shows that the major cations are calcium and sodium. Toward Westover, sodium becomes the dominant cation, calcium becomes subordinate, and bicarbonate concentration increases. This may be the result of mineral dissolution, which produces calcium and bicarbonate ions, and the available calcium exchanging with sodium from clay minerals as the water moves through the aquifer. South of Westover, both sodium and chloride concentrations increase, probably due to the presence of brackish water in the aquifer.

The areal distribution of chloride in the Manokin aquifer is shown in figure 26, which was constructed using data from water samples collected for this investigation during the summer of 1986 and 1985-86 chloride data from files of the Somerset County Health Department (table 7). From the northern part of the county, chloride concentrations gradually increase southwestward to the vicinity of Westover. Here, perpendicular to a line that roughly trends from Pocomoke City to Deal Island, the concentration gradient is steep, with chloride concentration increasing from 150 mg/L to more than 500 mg/L in a distance of about 2 mi. Chloride concentrations are not known in the central part of the county because few wells are drilled in the Manokin aquifer there. Local drillers, however, report the water in this area as being "very salty." Therefore, it is likely that chloride concentrations exceed 500 mg/L. In the Crisfield area, chloride concentrations decrease slightly. Here the

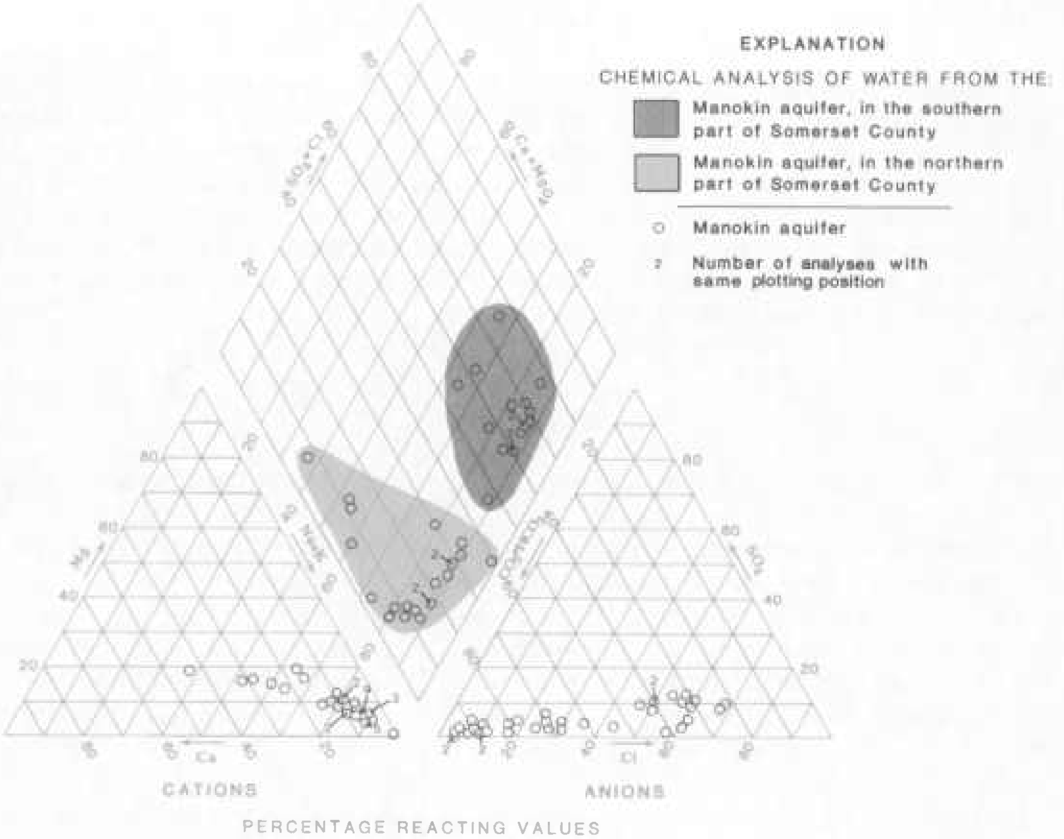



Figure 25.— Trilinear diagram for water from the Manokin aquifer.

confining units overlying the Manokin aquifer are more permeable than in other parts of the county, and water containing lower concentrations of chloride may migrate downward from overlying aquifers. A short distance from Crisfield, however, chloride concentrations approach 500 mg/L.

There are several possible explanations for the occurrence of water containing high levels of chloride in the Manokin aquifer. One explanation is that the lowering of hydraulic head in the Princess Anne area has resulted in the migration of brackish water from the Chesapeake Bay toward pumping centers. If this were the case, analyses for samples collected in the area south of Westover prior to ground-water development should have considerably lower chloride concentrations than recent analyses. In fact, analyses from the 1950's, when the principal direction of ground-water flow was toward the Chesapeake Bay, also show high chloride concentrations in the area south of Westover (Rasmussen and Slaughter, 1955, p. 202-203). Therefore, it is doubtful that the high chloride concentrations have resulted from ground-water pumpage.

Other explanations for the observed chloride concentrations include incomplete flushing of the aquifer and the presence of a transition zone. Because the aquifer subcrops beneath Chesapeake Bay, an interface between freshwater in the aquifer and brackish water of the

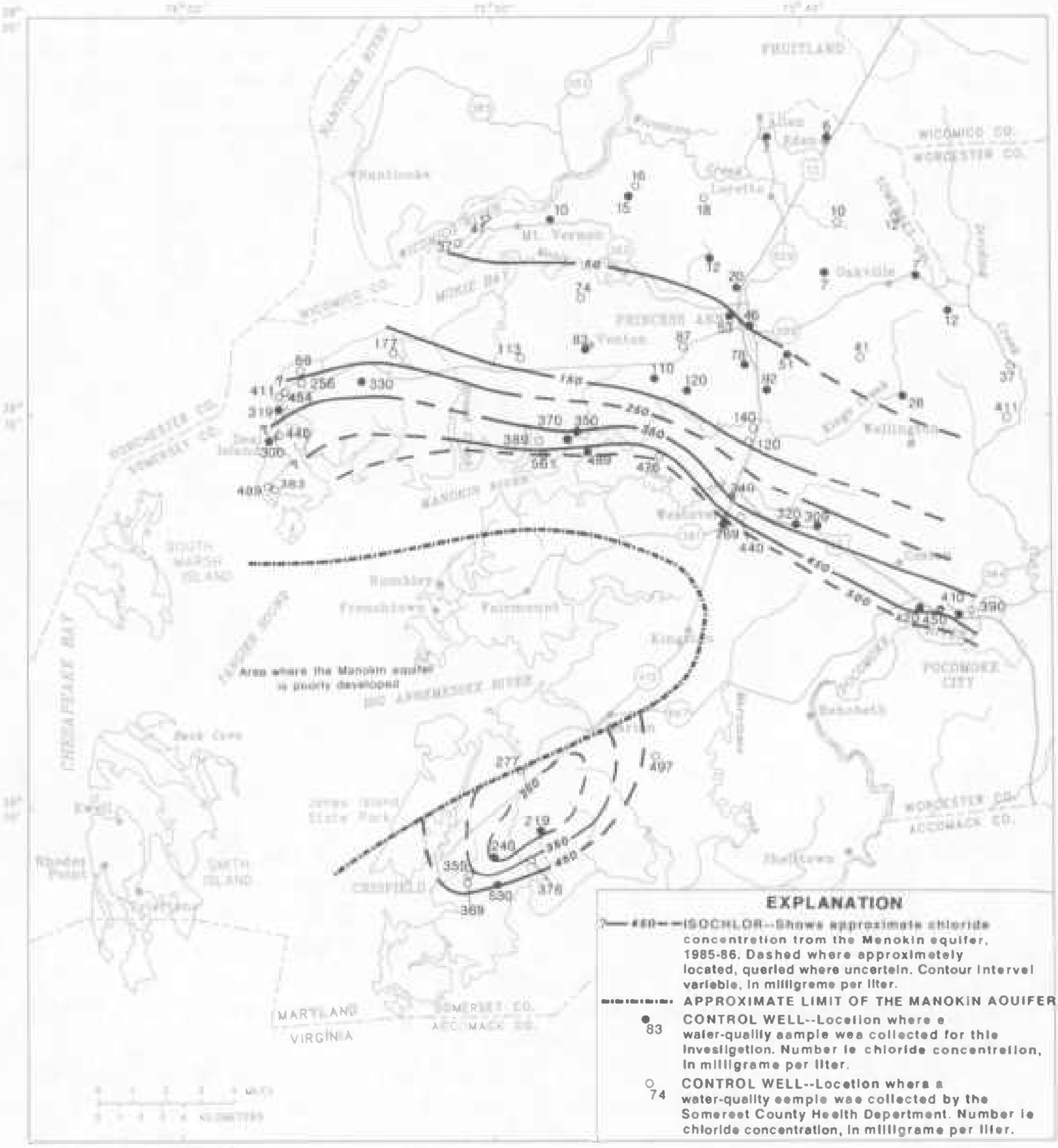



Figure 26.— Chloride concentration in water from the Manokin aquifer, 1985-86.

TABLE 7
CHLORIDE CONCENTRATIONS IN WATER FROM WELLS SAMPLED BY THE SOMERSET COUNTY HEALTH DEPARTMENT
[ft = feet; mg/L = milligrams per liter]

| Well no. | Well depth (ft) | Chloride concentration (mg/L) |
|---|---|---|
| SO Ad 15 | 150 | 16 |
| SO Ae 21 | 160 | 18 |
| SO Bb 20 | 150 | 454 |
| SO Bb 21 | 140 | 58 |
| SO Bb 22 | 160 | 256 |
| SO Bb 24 | 150 | 411 |
| SO Bc 17 | 120 | 177 |
| SO Bc 18 | 140 | 47 |
| SO Bc 19 | 125 | 37 |
| SO Bd 43 | 150 | 113 |
| SO Bd 46 | 160 | 74 |
| SO Be 107 | 190 | 87 |
| SO Bf 22 | 230 | 41 |
| SO Bf 24 | 240 | 10 |
| SO Bf 25 | 235 | 12 |
| SO Bg 5 | 260 | 37 |
| SO Cb 25 | 160 | 383 |
| SO Cb 26 | 140 | 489 |
| SO Cb 27 | 140 | 440 |
| SO Cd 53 | 180 | 389 |
| SO Cd 54 | 160 | 561 |
| SO Ce 44 | 240 | 140 |
| SO Ce 48 | 230 | 120 |
| SO Ce 90 | 230 | 440 |
| SO Ce 94 | 185 | 476 |
| SO Dd 64 | 185 | 277 |
| SO De 42 | 210 | 497 |
| SO Dg 10 | 220 | 390 |
| SO Ec 53 | 200 | 369 |
| SO Ec 55 | 200 | 355 |
| SO Ed 48 | 205 | 376 |

bay would develop naturally. This interface, rather than being a sharp boundary, is more likely to be a zone of diffusion where brackish water and freshwater mix. Possibly, the natural position of this zone is in the southern part of the county. Zones of incomplete flushing may occur north of Crisfield, where the aquifer becomes less permeable. This low-permeability area north of Crisfield restricts ground-water flow, which may result in localized stagnation zones and areas where saltwater trapped during times of higher sea level has not been completely flushed from the system.

Although the zone of water containing high concentrations of chloride may have resulted from natural processes, it has the potential to migrate toward pumping centers at Princess Anne. In the early 1950's, regional ground-water flow in the Manokin aquifer was from northeast to southwest, and thus stabilized the poorer-quality water in the vicinity of Westover. Ground-water flow in the county is presently toward Princess Anne, and water containing elevated chloride concentrations may be migrating toward the Princess Anne area. The rate of this possible migration is addressed in later sections of this report.

Dissolved iron is a problem in the Manokin aquifer in the northern part of the county, where concentrations in water samples reach 4.1 mg/L. Figure 27 shows dissolved-iron concentrations at sampled locations. Iron concentrations are generally greatest in the northeastern corner of the county and progressively decrease toward the south, in the direction

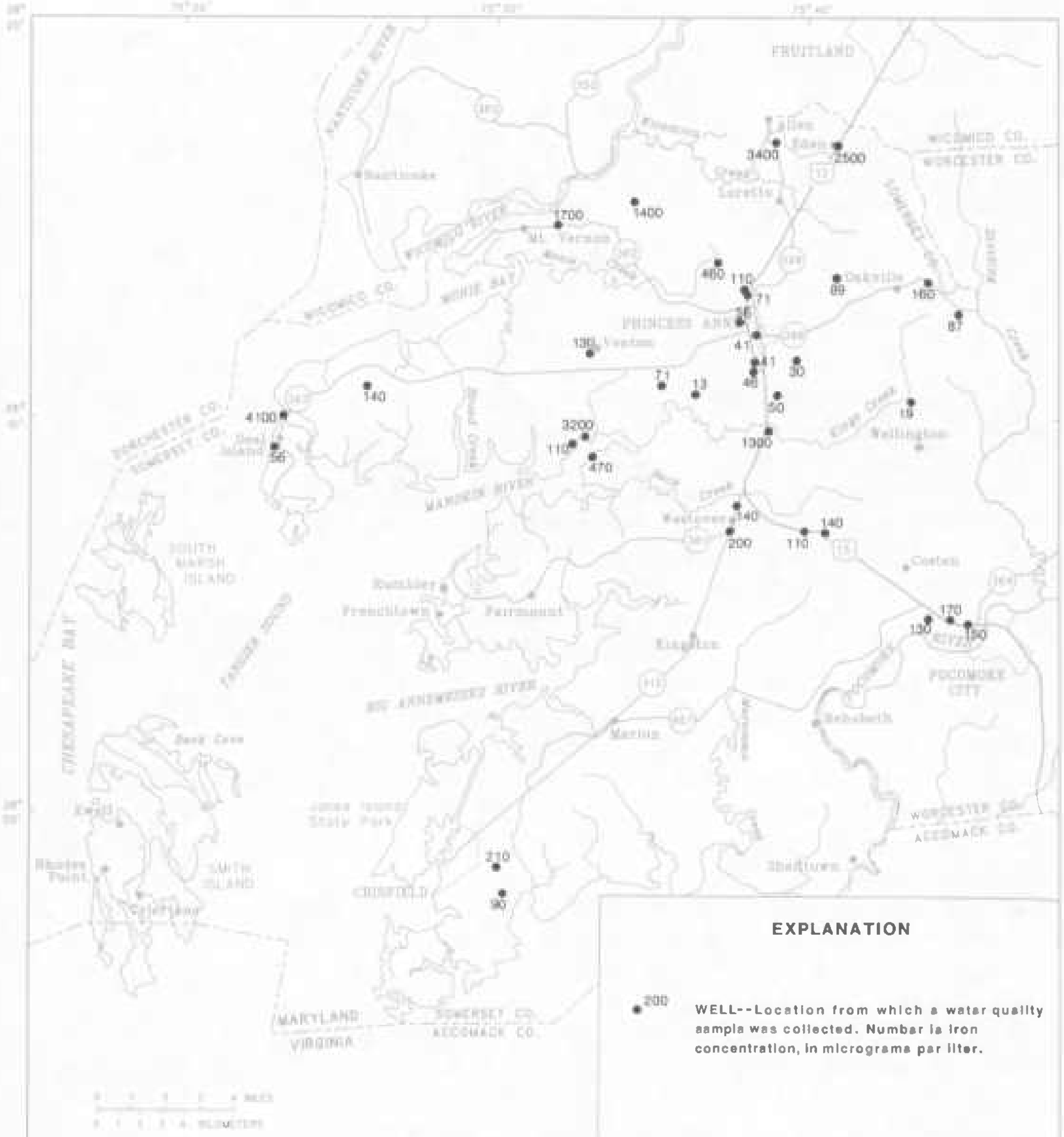



Figure 27.— Iron concentration in water from the Manokin aquifer, 1986.

of pre-development ground-water flow. Conversely, pH tends to increase in the direction of pre-development ground-water flow (northeast to west and southwest), probably because bicarbonate is brought into solution from mineral dissolution (Cushing and others, 1973, p. 9). Figure 28 is a graph of pH versus total iron concentration and shows a general trend of decreasing iron concentration with increasing pH. Cushing and others (1973, p. 9) noted a downgradient decrease in iron concentration in confined aquifers in other parts of the Delmarva Peninsula. They attributed this decrease to increasing pH along a flow path, causing precipitation of siderite. Langmuir (1969) observed a downgradient decrease in iron concentrations in water from Cretaceous-age sediments in New Jersey. He explained the decrease as a result of increasing stability of suspended amorphous material due to aging, coupled with adsorption of ferrous iron by oxyhydroxides at pH greater than 6.5.

## Paleocene and Potomac Aquifer Systems

The Paleocene and Potomac aquifer systems contain the deepest aquifers used in Somerset County. For this investigation, one water-quality sample was collected from a well screened in the Paleocene aquifer system (SO Ec 1), one sample was collected from a well screened in both aquifer systems (SO Ec 49), and eight samples were collected from wells in the Potomac aquifer system. Several wells in the Crisfield area are screened in both the Paleocene and Potomac aquifer systems. The multiple screens in these wells may allow water in the two aquifer systems to mix.

Water in the two aquifer systems is a sodium-bicarbonate type, with sodium accounting for more than 95 percent of the cations (fig. 29). Alkalinities are the greatest of any of the aquifers in Somerset County (fig. 30). The dominance of sodium and bicarbonate is probably best explained by ion-exchange processes (Foster, 1950). As ground water moves downgradient it becomes enriched in calcium and bicarbonate through mineral dissolution. As water continues in the flow system, calcium is depleted as it is exchanged for sodium in clay minerals. Because calcium is depleted, the ground water cannot achieve equilibrium with calcite and more bicarbonate is introduced into the ground water, resulting in a sodium-bicarbonate type water.

Minerals present in the two aquifer systems that may supply calcium and bicarbonate include calcite, aragonite, and silicate minerals (principally feldspar). Because the Potomac Group is nonmarine, the principal sources of calcium and bicarbonate are probably silicate minerals.

Figure 31 shows Stiff diagrams depicting the distribution of major ions in water from 10 wells in the two aquifer systems. In the area of use, the composition of the water is relatively uniform. Some samples contain greater concentrations of chloride, but no areal pattern is apparent. Overall, the water in these two aquifer systems is soft, has dissolved-solids concentrations ranging from 475 to 1,070 mg/L, and has the highest pH of any aquifer in the county (fig. 32).

The major water-quality problem in the Paleocene and Potomac aquifer systems is elevated concentrations of fluoride (Kula and Hansen, 1989). Seven water samples collected for this study exceed the SMCL of 2.0 mg/L and two of these exceed the MCL of 4.0 mg/L (U.S. Environmental Protection Agency, 1986a). Fluoride occurs in accessory minerals in most sediments, although the low solubility of these minerals usually causes fluoride concentrations to be less than 1.0 mg/L (Cushing and others, 1973, p. 8). Primary

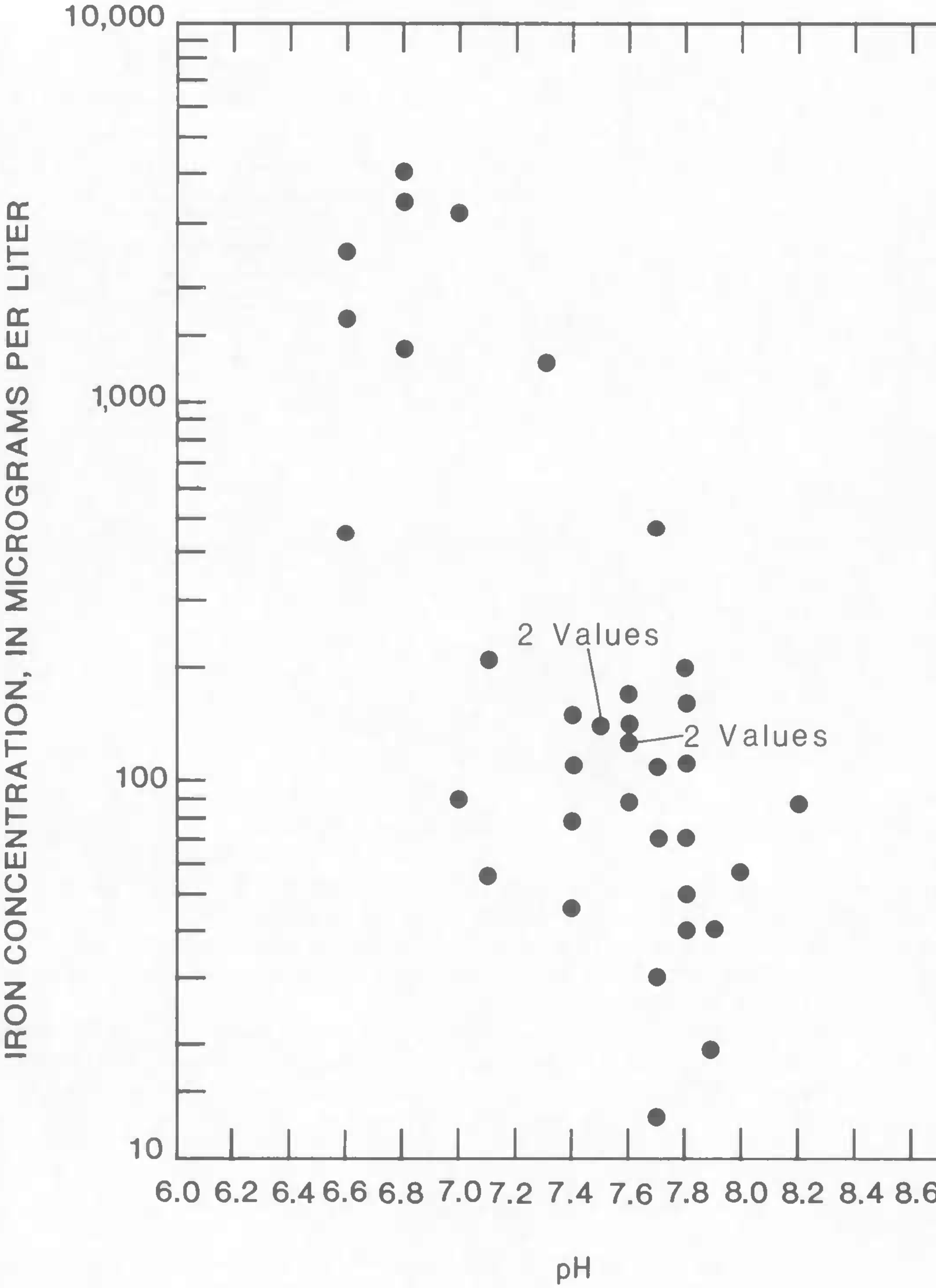



Figure 28.— Relation of iron concentration to pH in water from the Manokin aquifer.

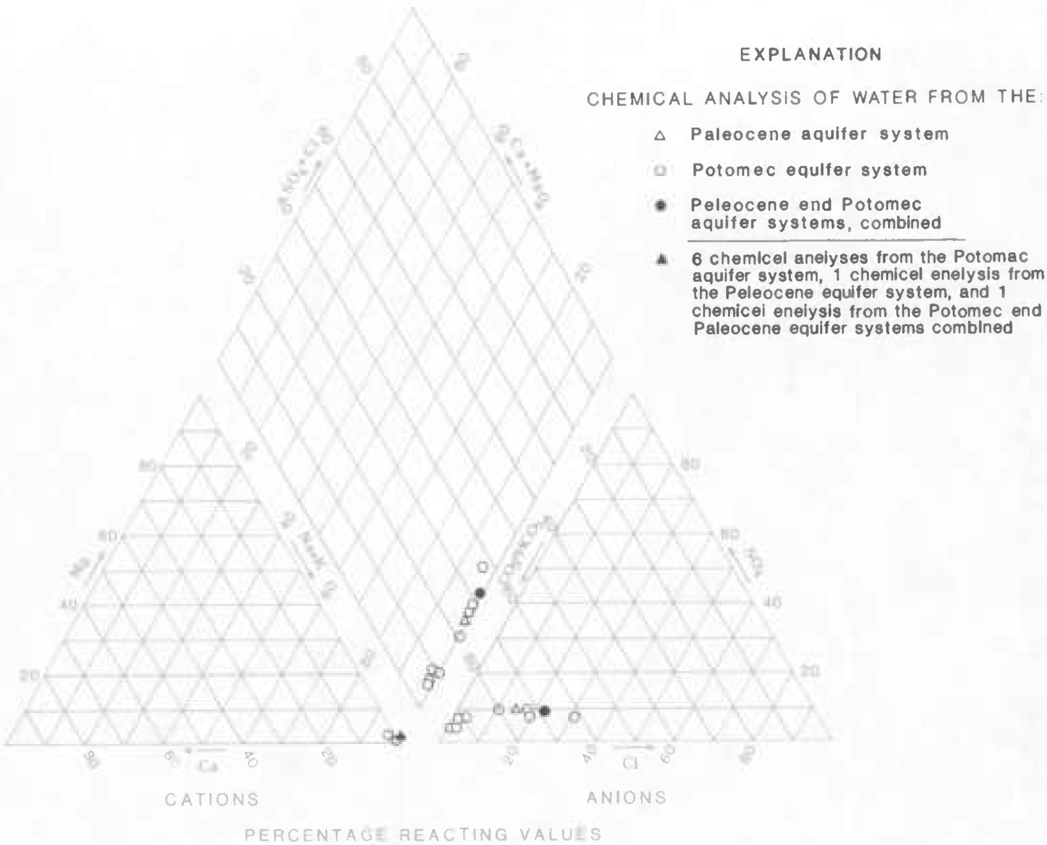



Figure 29.— Trilinear diagram for water from the Paleocene and Potomac aquifer systems.

sources of fluoride are fluorite and apatite (Hem, 1985, p. 121). It is also a minor component in such hydroxide-bearing minerals as biotite, muscovite, kaolinite, and horneblende. The relatively high concentrations of fluoride in water in the Paleocene and Potomac aquifer systems may be due to ion exchange between hydroxide and fluoride ions, or to changes in the mineralogy of the sediments.

The water quality in the area of use does not appear to have changed appreciably since the 1950's. However, the position of the saltwater interface in the Paleocene and Potomac aquifer systems east of Crisfield is not known. Because the hydraulic heads in the aquifer systems have been lowered due to pumping, the interface may be migrating westward.

## EFFECTS OF GROUND-WATER DEVELOPMENT

Ground-water demand in Princess Anne and Crisfield (fig. 33), where most pumping is currently located, is expected to increase in the near future. Meeting this demand will involve putting new production wells into service, as well as increasing the pumping rate of existing wells. The purpose of this section is to describe the probable effects of additional withdrawals in these two areas on the ground-water-flow system.

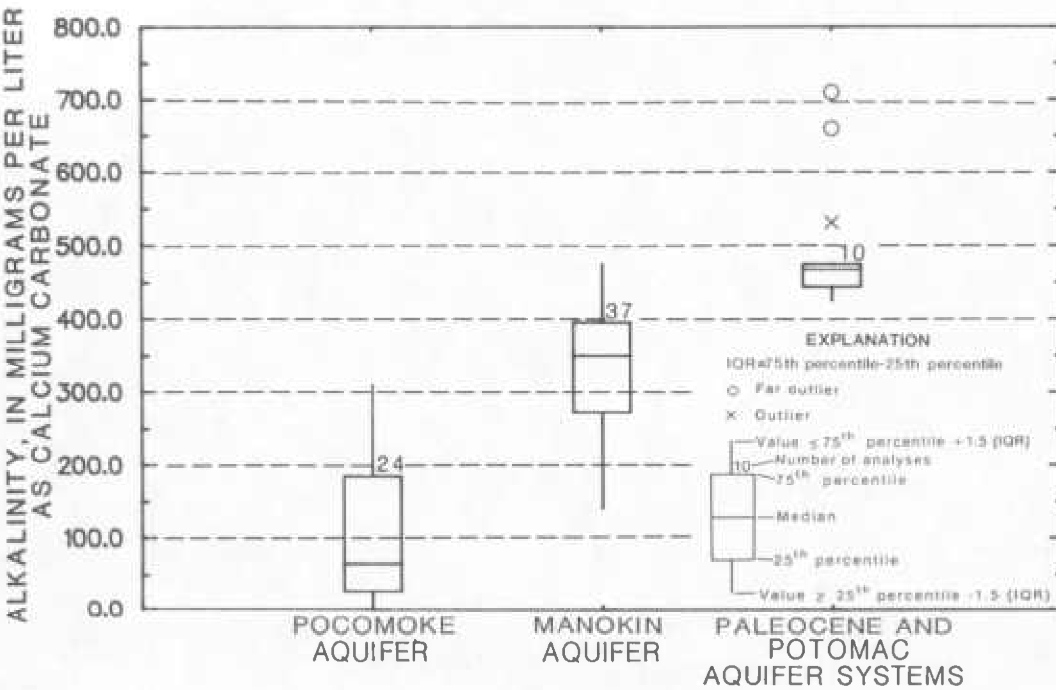


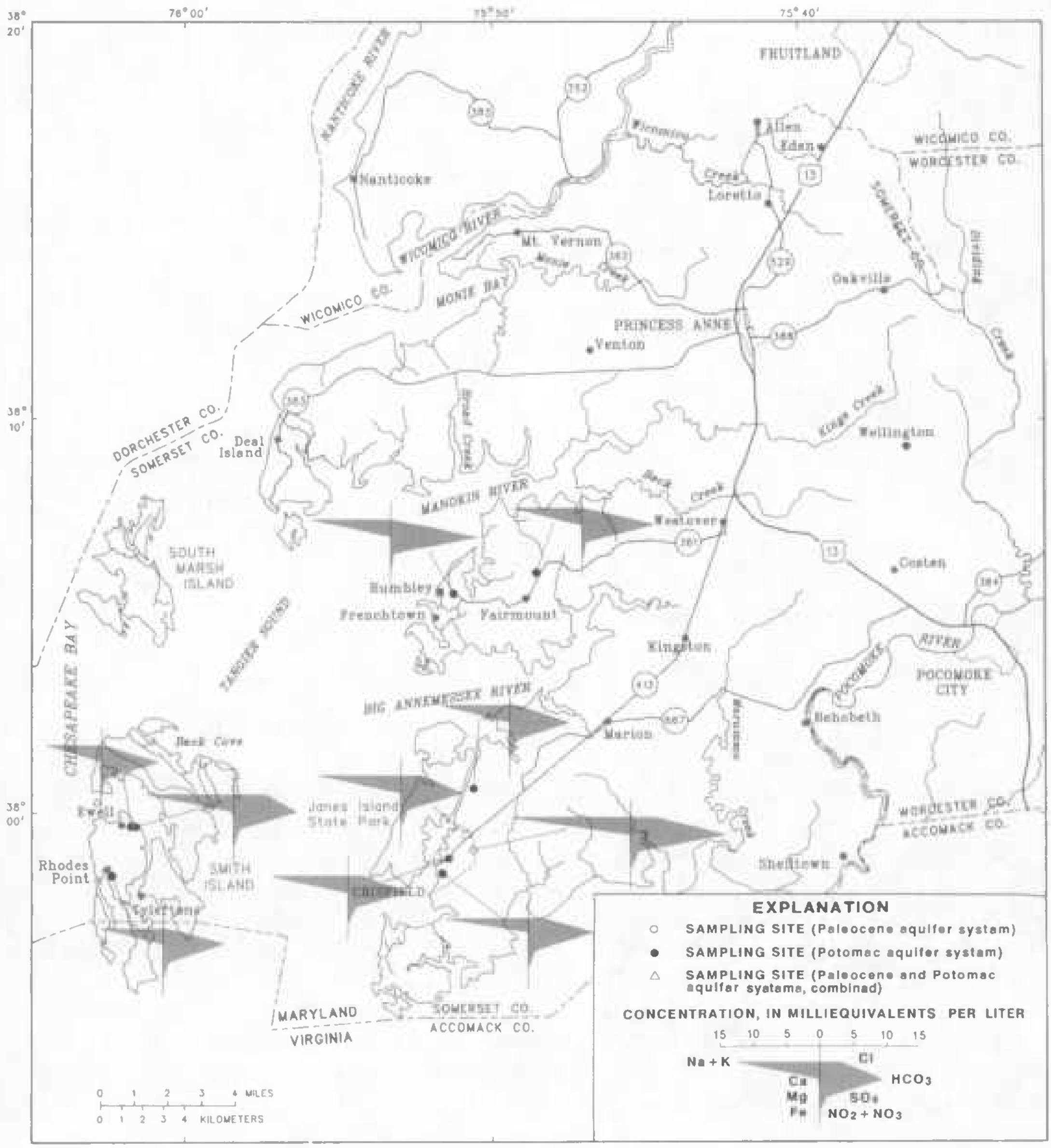

Figure 30.— Alkalinity of water from the principal aquifers.

## Effects of Projected Ground-Water Pumpage in the Princess Anne Area

The Manokin aquifer is the principal source of ground water in the Princess Anne area. Users of more than 10,000 gal/d include the town of Princess Anne, a plywood-manufacturing plant, a poultry-raising operation, and the Eastern Correctional Institution. Ground-water-level altitudes in the area range from about 5 ft above sea level to about 20 ft below sea level. Ground-water pumpage is expected to increase by about 600,000 gal/d by the year 2000 (J. Windsor, Somerset County Department of Technical and Community Services, written commun., 1986), primarily to meet the water demands of the Eastern Correctional Institution. Water levels are expected to decline further as a result of the increased withdrawals. The present ground-water-flow system and the effects of increased withdrawals from the Manokin aquifer on the ground-water-flow system were evaluated with a digital ground-water-flow model.

### Model description and grid

This investigation used the U.S. Geological Survey's modular three-dimensional finite-difference ground-water-flow model (McDonald and Harbaugh, 1988) to simulate flow in the Manokin aquifer in the Princess Anne area. The model was used to simulate steady-state conditions (that is, water levels and fluxes do not change with time). Simulations of transient conditions were not conducted for the following reasons:




Base from Maryland Geological Survey, 1:62,500.

Figure 31.— Chemical characteristics of water from the Paleocene and Potomac aquifer systems.

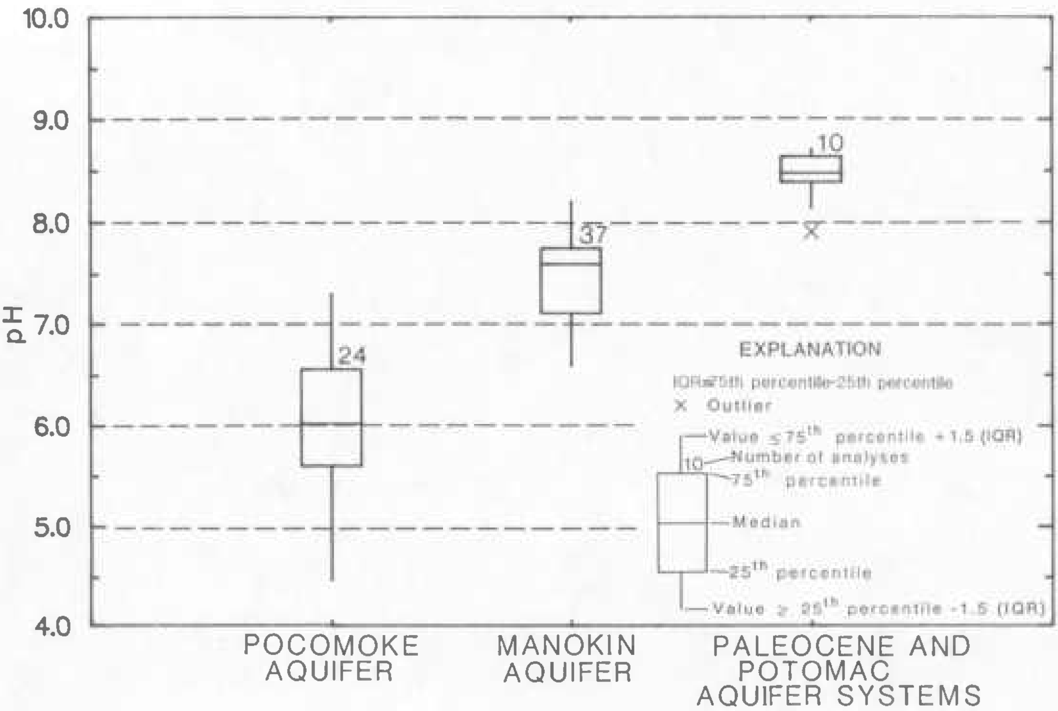



Figure 32.—pH of water from the principal aquifers.

(1) The purpose of the modeling was not to predict water levels at specific times, but to estimate the long-term effects of increased withdrawals; and
(2) data such as ground-water withdrawals over time and long-term water-level measurements that are necessary to properly calibrate the model under transient conditions were unavailable.

Briefly, the model operates by using finite-difference approximations of the partial-differential equation that describes ground-water flow. Instead of being treated as a single continuous system, the ground-water-flow system is represented by a grid of rectangular blocks. Each block, or cell, is considered to have uniform properties, and a finite-difference approximation is formulated for every cell. The unknown variable, hydraulic head, is found by solving the finite-difference approximation by an iterative procedure. If the inputs to the model are of sufficient accuracy, the model-generated water levels will compare favorably to observed water levels. The model is then considered calibrated. The calibrated model can be used to evaluate the response of the ground-water-flow system to imposed stresses, such as increased ground-water withdrawals. McDonald and Harbaugh (1988) present a detailed description of the features and mathematical development of the model used in this investigation.

The grid representing the ground-water-flow system in the Princess Anne area consists of two layers, each containing 57 rows and 47 columns of cells. The size of the grid cells differs, ranging from 1,000 ft on a side near pumping wells to 8,000 ft on a side at the boundaries of the model. The grid (fig. 34) is larger than the area of interest (fig. 33) because

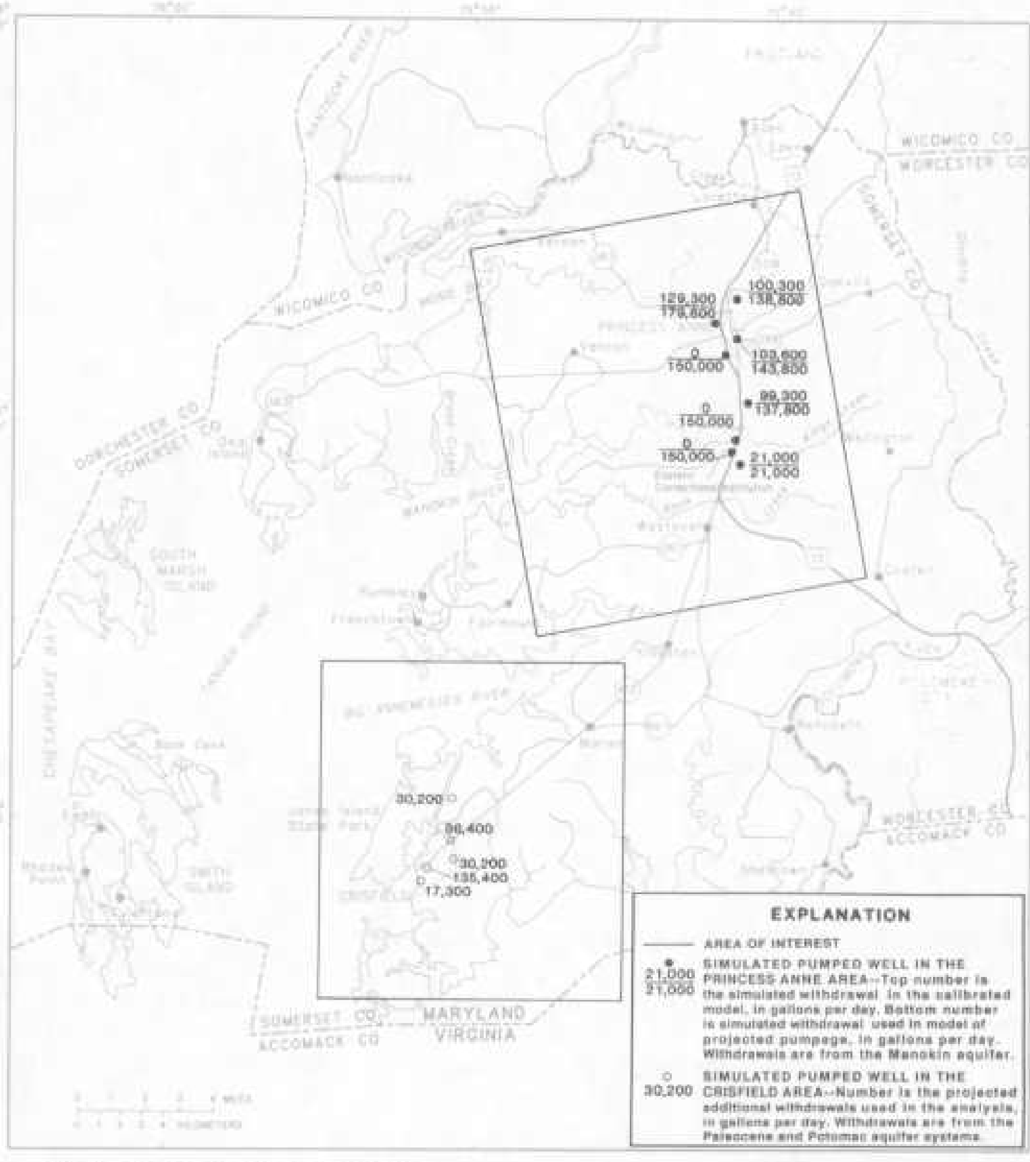



Figure 33.— Location of modeled areas and simulated pumpage distributions.

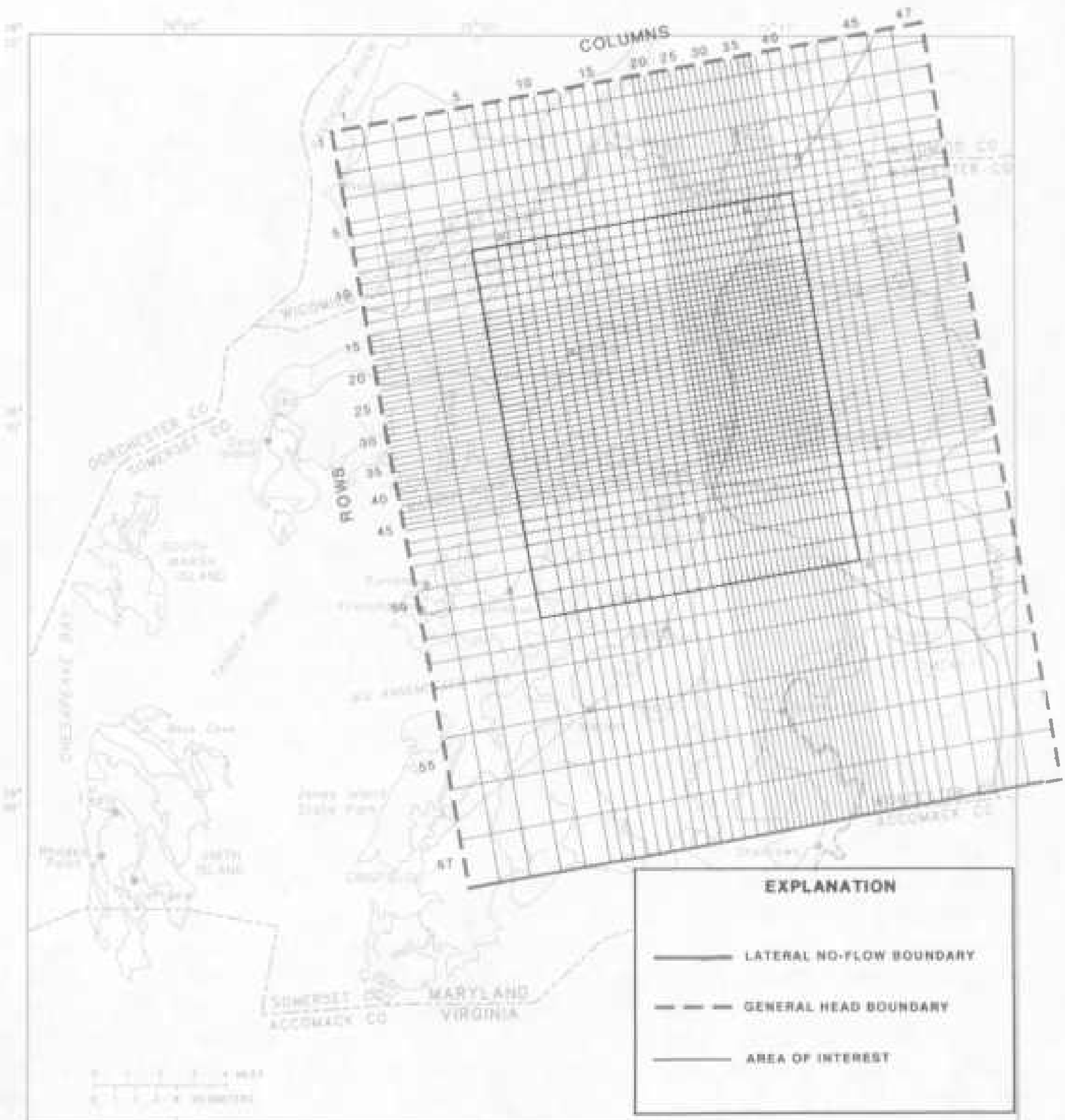



Figure 34.– Model grid for the Princess Anne area.

water levels within the area of interest are affected by conditions beyond it. By convention, the numbering system for the rows and columns begins in the upper left corner of the grid. Each cell is referenced by layer, row, and column. For example, cell 2, 10, 20 is located in the second layer, at the intersection of row 10 and column 20.

## Conceptual model and boundary conditions

To make the ground-water-flow system amenable to mathematical analysis, geologic and hydrologic conditions in the study area must be simplified into a conceptual model. The conceptual model for the Princess Anne area (fig. 35) consists of the following characteristics and assumptions:

(1) The aquifers under consideration are represented by two layers. The upper layer (layer 1) comprises the surficial aquifer system and the Pocomoke aquifer. The lower layer (layer 2) consists of the Manokin aquifer;
(2) the confining unit overlying the Manokin aquifer is not modeled as an active layer. Leakance is not calculated by the model, but is determined independently by dividing vertical hydraulic conductivity of the confining unit by the thickness of the confining unit. These values are then supplied to the model for calculation of vertical flow through the confining unit;
(3) ground-water flow in the Manokin aquifer is horizontal;
(4) water levels in the surficial aquifer system and the Pocomoke aquifer are constant, thus the top layer is not an active layer;
(5) ground water may flow laterally across the northern, eastern, and western boundaries of the modeled area. This lateral flow is simulated by using the general-head-boundary package in the model (McDonald and Harbaugh, 1988);
(6) the confining unit underlying the Manokin aquifer contributes negligible amounts of water to the aquifer and is represented as a no-flow boundary; and
(7) the ground-water-flow system is at steady state.

Several components of the conceptual model require further explanation. The general-head-boundary package simulates a source of water outside the modeled area that supplies water to a cell at a rate dependent on the water-level difference between the source and the cell (McDonald and Harbaugh, 1988, p. 11-1). The water level at the source is assigned as a constant value and the aquifer material between the source and the cell is represented by a hydraulic conductance (transmissivity of the material multiplied by width of the cell divided by distance to the source from the cell). Sources of water to the boundary cells along the western and northern sides of the model are the subcrop areas of the Manokin aquifer, which are located outside the modeled area. The source of water for the eastern boundary cells is an area of relatively high heads east of the modeled area that is indicated on published maps of the Manokin aquifer (Cushing and others, 1973; Hodges, 1984). Water levels were assigned to the sources based on published reports (Bachman and Wilson, 1984; Hodges, 1984) and data from observation wells. Hydraulic conductances were assigned on the basis of information from published reports (Rasmussen and Slaughter, 1955; Achmad and Weigle, 1979; and Hodges, 1984). Table 8 lists the water levels and hydraulic conductances used in the model. Little is known about water levels to the south of the modeled area. The southern model boundary is located far enough away that the boundary does not greatly affect heads in the area of interest; it was simulated as a no-flow boundary.

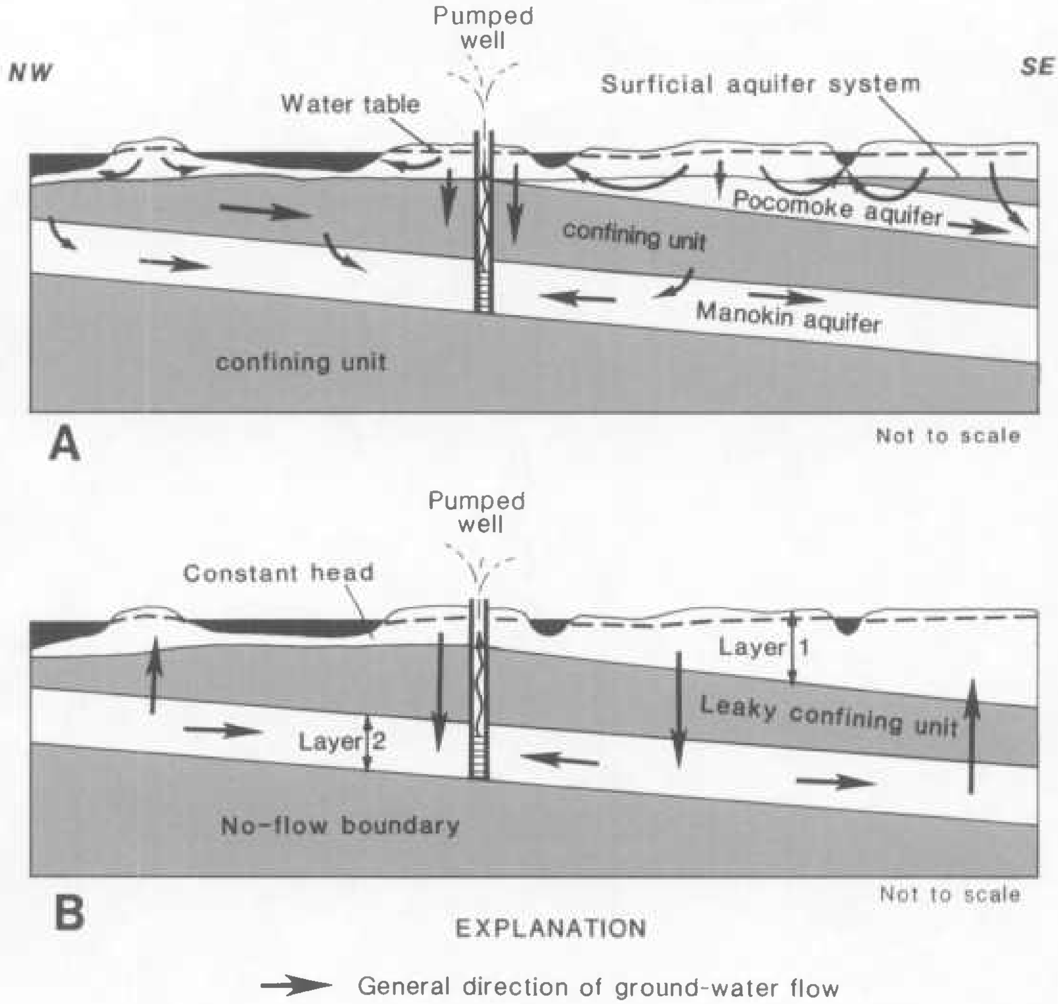



Figure 35.— Schematic representation of the actual ground-water-flow system in the Princess Anne area (A), and the simplified conceptual model (B).

The other component of the conceptual model requiring further explanation is the assumption that ground-water flow is at steady-state conditions. Although figure 15 indicates that the general decline of water level in well SO Be 42 was much less from 1983 to 1986 than in the 5 previous years, there is still a slight downward trend in the 1983-86 data. If the water levels to which the steady-state model is calibrated are under transient rather than steady-state conditions, the aquifer properties derived from the calibration may be inaccurate.

Figure 36 shows continuous water levels in observation well SO Ce 42 and periodic water levels in observation well SO Cf 2 for January 1986 to June 1987. SO Ce 42 is screened in the Manokin aquifer, about 2 mi southwest of the nearest production well, whereas SO Cf

TABLE 8
WATER LEVELS AND HYDRAULIC CONDUCTANCES USED FOR GENERAL-HEAD BOUNDARIES IN THE MODEL OF THE PRINCESS ANNE AREA
[ft = feet above sea level; $ft^2/d$ = feet squared per day]

| Model layer | Row | Column | Water level (ft) | Hydraulic conductance ($ft^2/d$) | Model layer | Row | Column | Water level (ft) | Hydraulic conductance ($ft^2/d$) |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | 0 | 1,700 | 2 | 33 | 47 | 15 | 80 |
| 2 | 1 | 2 | 1 | 680 | 2 | 34 | 47 | 15 | 80 |
| 2 | 1 | 3 | 1 | 425 | 2 | 35 | 47 | 15 | 80 |
| 2 | 1 | 4 | 1 | 260 | 2 | 36 | 47 | 15 | 85 |
| 2 | 1 | 5 | 2 | 210 | 2 | 37 | 47 | 15 | 85 |
| 2 | 1 | 6 | 3 | 95 | 2 | 38 | 47 | 15 | 85 |
| 2 | 1 | 7 | 4 | 80 | 2 | 39 | 47 | 15 | 80 |
| 2 | 1 | 8 | 5 | 80 | 2 | 40 | 47 | 15 | 75 |
| 2 | 1 | 9 | 5 | 80 | 2 | 41 | 47 | 15 | 80 |
| 2 | 1 | 10 | 5 | 75 | 2 | 42 | 47 | 15 | 80 |
| 2 | 1 | 11 | 6 | 70 | 2 | 43 | 47 | 10 | 80 |
| 2 | 1 | 12 | 7 | 65 | 2 | 44 | 47 | 10 | 70 |
| 2 | 1 | 13 | 8 | 60 | 2 | 45 | 47 | 10 | 60 |
| 2 | 1 | 14 | 9 | 50 | 2 | 46 | 47 | 10 | 100 |
| 2 | 1 | 15 | 10 | 45 | 2 | 47 | 47 | 5 | 100 |
| 2 | 1 | 16 | 11 | 40 | 2 | 48 | 47 | 5 | 100 |
| 2 | 1 | 17 | 12 | 35 | 2 | 49 | 47 | 5 | 200 |
| 2 | 1 | 18 | 13 | 30 | 2 | 50 | 47 | 5 | 180 |
| 2 | 1 | 19 | 14 | 24 | 2 | 51 | 47 | 5 | 160 |
| 2 | 1 | 20 | 15 | 23 | 2 | 52 | 47 | 1 | 190 |
| 2 | 1 | 21 | 16 | 22 | 2 | 53 | 47 | 1 | 210 |
| 2 | 1 | 22 | 17 | 22 | 2 | 54 | 47 | 1 | 540 |
| 2 | 1 | 23 | 18 | 22 | 2 | 2 | 1 | 0 | 700 |
| 2 | 1 | 24 | 20 | 22 | 2 | 3 | 1 | 0 | 470 |
| 2 | 1 | 22 | 25 | 21 | 2 | 4 | 1 | 0 | 360 |
| 2 | 1 | 26 | 25 | 20 | 2 | 5 | 1 | 0 | 150 |
| 2 | 1 | 27 | 25 | 20 | 2 | 6 | 1 | 0 | 110 |
| 2 | 1 | 28 | 25 | 20 | 2 | 7 | 1 | 0 | 100 |
| 2 | 1 | 29 | 25 | 20 | 2 | 8 | 1 | 0 | 90 |
| 2 | 1 | 30 | 25 | 19 | 2 | 9 | 1 | 0 | 80 |
| 2 | 1 | 31 | 25 | 19 | 2 | 10 | 1 | 0 | 75 |
| 2 | 1 | 32 | 25 | 18 | 2 | 11 | 1 | 0 | 65 |
| 2 | 1 | 33 | 35 | 18 | 2 | 12 | 1 | 0 | 55 |
| 2 | 1 | 34 | 35 | 19 | 2 | 13 | 1 | 0 | 50 |
| 2 | 1 | 35 | 35 | 19 | 2 | 14 | 1 | 0 | 25 |
| 2 | 1 | 36 | 35 | 19 | 2 | 15 | 1 | 0 | 20 |
| 2 | 1 | 37 | 35 | 20 | 2 | 16 | 1 | 0 | 20 |
| 2 | 1 | 38 | 35 | 20 | 2 | 17 | 1 | 0 | 19 |
| 2 | 1 | 39 | 35 | 40 | 2 | 18 | 1 | 0 | 18 |
| 2 | 1 | 40 | 35 | 40 | 2 | 19 | 1 | 0 | 18 |
| 2 | 1 | 41 | 40 | 45 | 2 | 20 | 1 | 0 | 17 |
| 2 | 1 | 42 | 40 | 45 | 2 | 21 | 1 | 0 | 16 |
| 2 | 1 | 43 | 45 | 50 | 2 | 22 | 1 | 0 | 15 |
| 2 | 1 | 44 | 45 | 100 | 2 | 23 | 1 | 0 | 15 |
| 2 | 1 | 45 | 50 | 110 | 2 | 24 | 1 | 0 | 14 |
| 2 | 1 | 46 | 50 | 120 | 2 | 25 | 1 | 0 | 14 |
| 2 | 1 | 47 | 45 | 110 | 2 | 26 | 1 | 0 | 13 |
| 2 | 2 | 47 | 45 | 100 | 2 | 27 | 1 | 0 | 13 |
| 2 | 3 | 47 | 40 | 100 | 2 | 28 | 1 | 0 | 13 |
| 2 | 4 | 47 | 35 | 110 | 2 | 29 | 1 | 0 | 12 |
| 2 | 5 | 47 | 35 | 80 | 2 | 30 | 1 | 0 | 12 |
| 2 | 6 | 47 | 35 | 80 | 2 | 31 | 1 | 0 | 12 |
| 2 | 7 | 47 | 35 | 65 | 2 | 32 | 1 | 0 | 11 |
| 2 | 8 | 47 | 30 | 65 | 2 | 33 | 1 | 0 | 11 |
| 2 | 9 | 47 | 30 | 70 | 2 | 34 | 1 | 0 | 11 |
| 2 | 10 | 47 | 30 | 75 | 2 | 35 | 1 | 0 | 10 |
| 2 | 11 | 47 | 30 | 75 | 2 | 36 | 1 | 0 | 10 |
| 2 | 12 | 47 | 30 | 80 | 2 | 37 | 1 | 0 | 10 |
| 2 | 13 | 47 | 25 | 80 | 2 | 38 | 1 | 0 | 9 |
| 2 | 14 | 47 | 25 | 45 | 2 | 39 | 1 | 0 | 9 |
| 2 | 15 | 47 | 25 | 45 | 2 | 40 | 1 | 0 | 9 |
| 2 | 16 | 47 | 25 | 45 | 2 | 41 | 1 | 0 | 9 |
| 2 | 17 | 47 | 25 | 50 | 2 | 42 | 1 | 0 | 9 |
| 2 | 18 | 47 | 25 | 50 | 2 | 43 | 1 | 0 | 8 |
| 2 | 19 | 47 | 25 | 50 | 2 | 44 | 1 | 0 | 8 |
| 2 | 20 | 47 | 25 | 55 | 2 | 45 | 1 | 0 | 8 |
| 2 | 21 | 47 | 20 | 55 | 2 | 46 | 1 | 0 | 15 |
| 2 | 22 | 47 | 20 | 55 | 2 | 47 | 1 | 0 | 15 |
| 2 | 23 | 47 | 20 | 60 | 2 | 48 | 1 | 0 | 15 |
| 2 | 24 | 47 | 20 | 60 | 2 | 49 | 1 | 0 | 30 |
| 2 | 25 | 47 | 20 | 65 | 2 | 50 | 1 | 0 | 25 |
| 2 | 26 | 47 | 20 | 65 | 2 | 51 | 1 | 0 | 25 |
| 2 | 27 | 47 | 20 | 70 | 2 | 52 | 1 | 0 | 25 |
| 2 | 28 | 47 | 20 | 70 | 2 | 53 | 1 | 0 | 25 |
| 2 | 29 | 47 | 20 | 75 | 2 | 54 | 1 | 0 | 50 |
| 2 | 30 | 47 | 20 | 75 | 2 | 55 | 1 | 0 | 45 |
| 2 | 31 | 47 | 20 | 75 | 2 | 56 | 1 | 0 | 45 |
| 2 | 32 | 47 | 15 | 80 | | | | | |

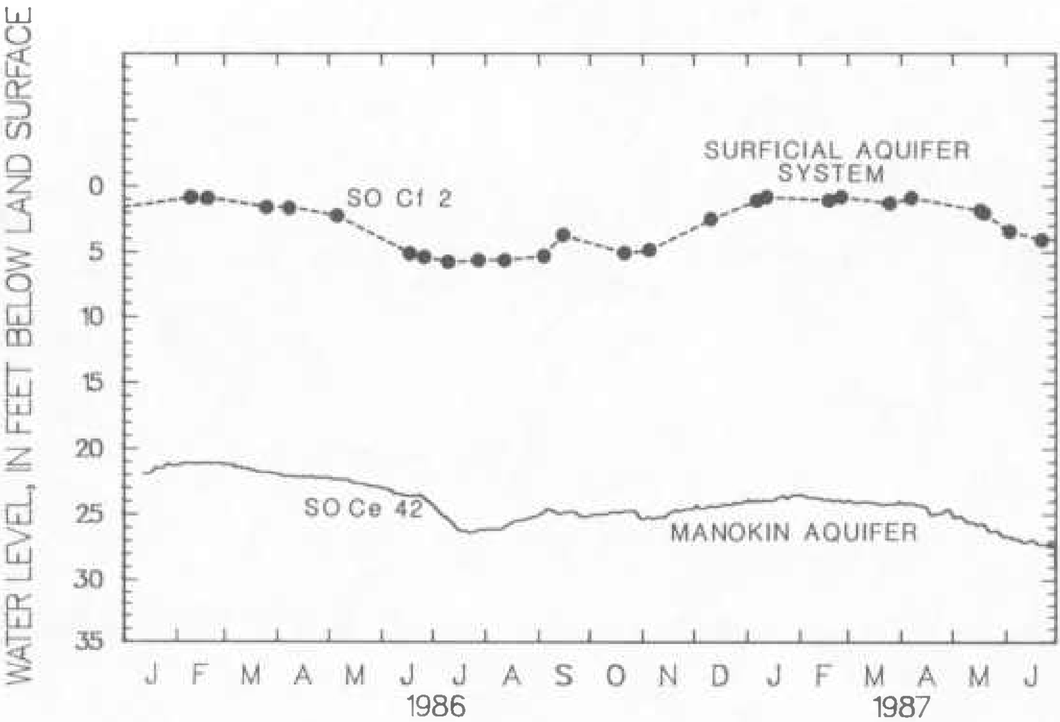



Figure 36.— Water levels in observation wells SO Ce 42 and SO Cf 2, 1986-87 (well locations shown on quadrangle maps Ce and Cf at end of report).

2 is screened in the surficial aquifer system and is not affected by nearby pumping. Seasonal fluctuations of water levels occur in each well, which indicates that some of the fluctuations in SO Ce 42 may be caused by natural conditions. Seasonal fluctuations in water levels due to natural causes tend to be cyclical, so that the system may approximate steady-state conditions over the long term. If this is the case in the Princess Anne area, the aquifer properties obtained by calibrating the model to water levels midway between the annual high and low water levels may be appropriate. Figure 37 shows water levels in SO Ce 42 and total monthly pumpage of the production wells at Princess Anne. Water levels in the observation well do not directly reflect changes in monthly pumpage, but there is a general downward trend in water levels, and a general increase in total monthly pumpage at Princess Anne. This indicates that the system probably is not at steady-state conditions. The effects of inaccurate aquifer properties are more fully addressed in the sections describing results and sensitivity analysis.

### Data requirements

The data necessary to model the Princess Anne area are aquifer transmissivity, vertical hydraulic conductivity and thickness of the confining unit overlying the Manokin aquifer, and ground-water-withdrawal rates from the Manokin aquifer. Initial estimates of aquifer transmissivity for the Manokin aquifer were determined by multiplying the thickness of the

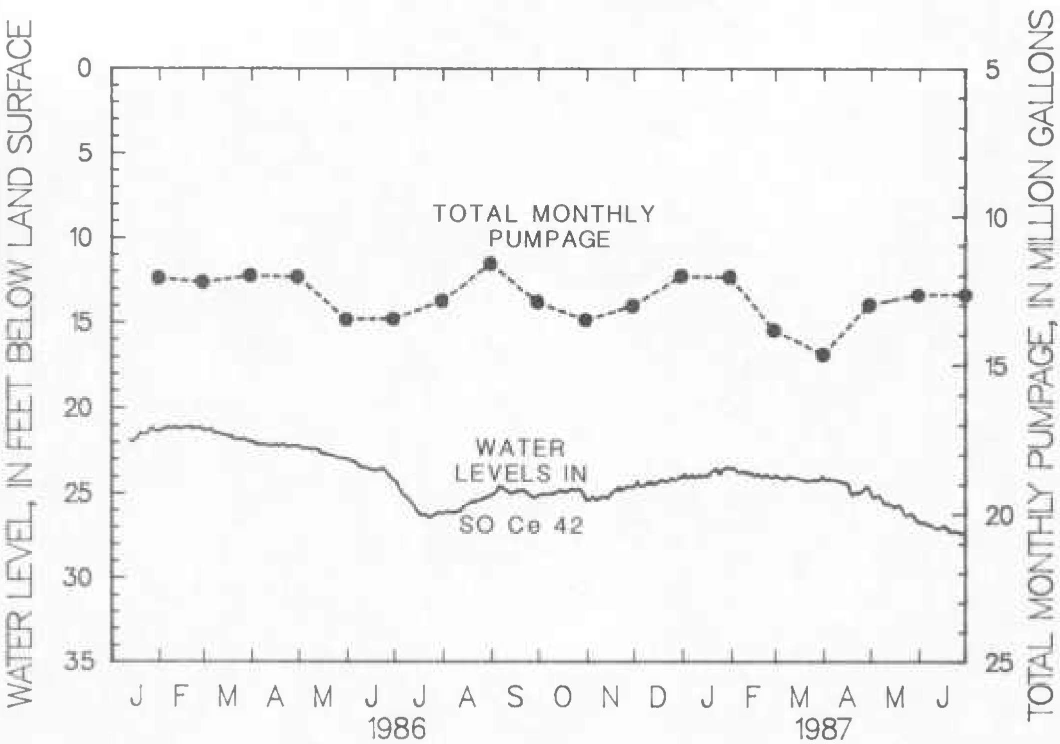



Figure 37.— Water levels in observation well SO Ce 42, and total monthly pumpage at Princess Anne, 1986-87 (well location shown on quadrangle map Ce at end of report).

aquifer (fig. 12) by an assumed constant hydraulic conductivity of 13.2 ft/d. During calibration, transmissivities were adjusted to the distribution shown in figure 13. Vertical hydraulic conductivity of the confining unit overlying the Manokin aquifer in Somerset County is not known. In Salisbury, Wolff (1970, p. 202) measured vertical hydraulic conductivity of between $2.8 \times 10^{-5}$ and $5.7 \times 10^{-3}$ ft/d for Miocene clays. In Ocean City, Achmad and Weigle (1979, p. 11) used a model-derived value of $1.9 \times 10^{-3}$ ft/d. The initial uniform value used in the Princess Anne area model was $1 \times 10^{-4}$ ft/d. This was adjusted during calibration to a final uniform value of $1 \times 10^{-5}$ ft/d. Thickness of the confining unit was obtained from figure 10. Withdrawal rates used in the model were the average reported pumpage for the town of Princess Anne from November 1985 to November 1986, and estimated pumpage for the other large users.

## Model calibration

The model was calibrated to water levels measured in the Manokin aquifer during the last week of November 1986. Water levels during this time were between the low water levels in July 1986 and the high water levels of January 1987 (fig. 36), and were thought to best approximate steady-state conditions.

During calibration, transmissivity of the Manokin aquifer (layer 2), vertical hydraulic conductivity of the overlying confining unit, and the hydraulic conductances and water levels of the general-head boundaries were adjusted independently until model-generated heads agreed approximately with measured water levels. The amount each input was adjusted from the initial value was dependent on the reliability of the original estimate. For example, transmissivity of the Manokin aquifer (layer 2) is relatively well known in the area of interest. Therefore, transmissivity was not allowed to differ greatly from the initial value. Accordingly, vertical hydraulic conductivity of the confining unit above the Manokin was allowed to range two orders of magnitude, and the water levels and hydraulic conductances in the general-head boundaries were allowed to differ by as much as 100 percent.

Calibration of the model was aided by comparing differences between observed and computed water levels and by minimizing the root mean square error (RMSE) of the differences between the observed and simulated water levels. The differences were compared to determine if the model was underestimating or overestimating water levels. The calibrated model overestimated water levels at 12 locations and underestimated water levels at 9 locations. The RMSE was calculated using the following formula:

$$\mathrm{RMSE} = \left[\frac{\Sigma\,(h_m - h_s)^2}{N}\right]^{1/2} \qquad (4)$$

where: N = the number of measured water levels;
$h_m$ = the water level measured in an observation well; and
$h_s$ = the simulated water level at the center of the cell that contains the observation well.

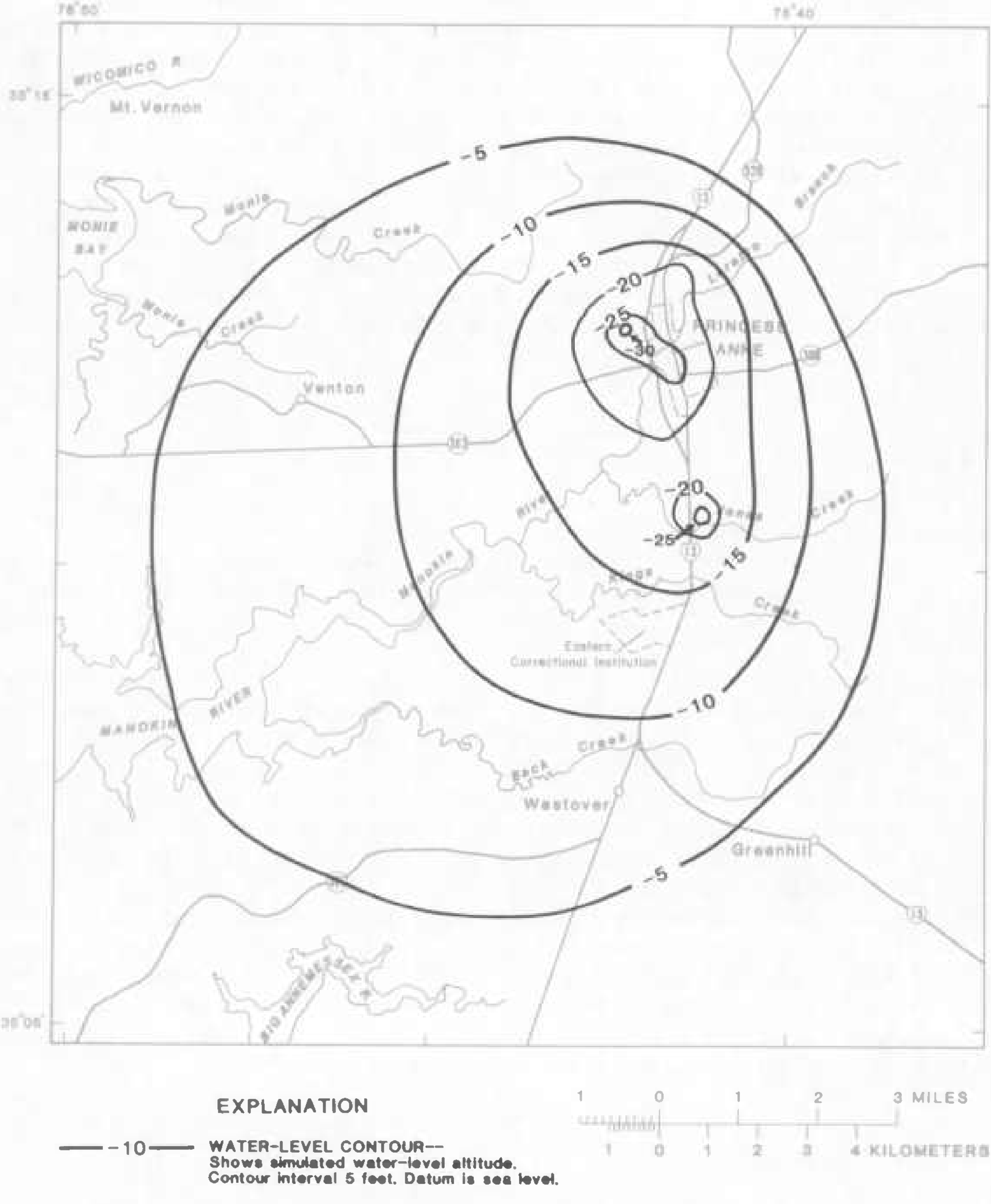
The calibrated model had a RMSE of 1 ft, with a maximum difference of 2 ft between observed and simulated water levels. Because many of the observation wells are grouped in specific locations, greater emphasis was placed on matching the areal distribution of observed water levels than on minimizing the RMSE.

Figures 38 and 39, respectively, show the model-generated water levels from the calibration simulation, and the water levels measured in the Manokin aquifer in November 1986. In general, water levels agree satisfactorily in the area of interest and differ somewhat in other parts of the modeled area.

The water budget generated by the model shows that 74 percent of the water entering the Manokin aquifer (layer 2) is derived from the general-head boundaries and 26 percent is from downward leakage through the overlying confining unit. Ground-water pumpage accounts for 97 percent of the water leaving the Manokin aquifer (pumped layer). About 1 percent leaves through upward leakage to the surficial aquifer system and Pocomoke aquifer (layer 1), and 2 percent leaves laterally to general-head boundaries.

### Sensitivity analysis

Sensitivity analysis involves changing one model input during a simulation, while keeping all other inputs constant. This gives an indication of which input most affects model results. Sensitivity analysis was performed on the calibrated steady-state model. During the sensitivity analysis, model inputs were changed by amounts inversely proportional to the reliance of their values. For example, vertical hydraulic conductivity of the upper confining




**EXPLANATION**

——— −10 ——— **WATER-LEVEL CONTOUR--**
**Shows simulated water-level altitude.**
**Contour interval 5 feet. Datum is sea level.**

Figure 38.— Simulated steady-state water-level altitudes in the Manokin aquifer using average daily pumpage from November 1985 to November 1986.

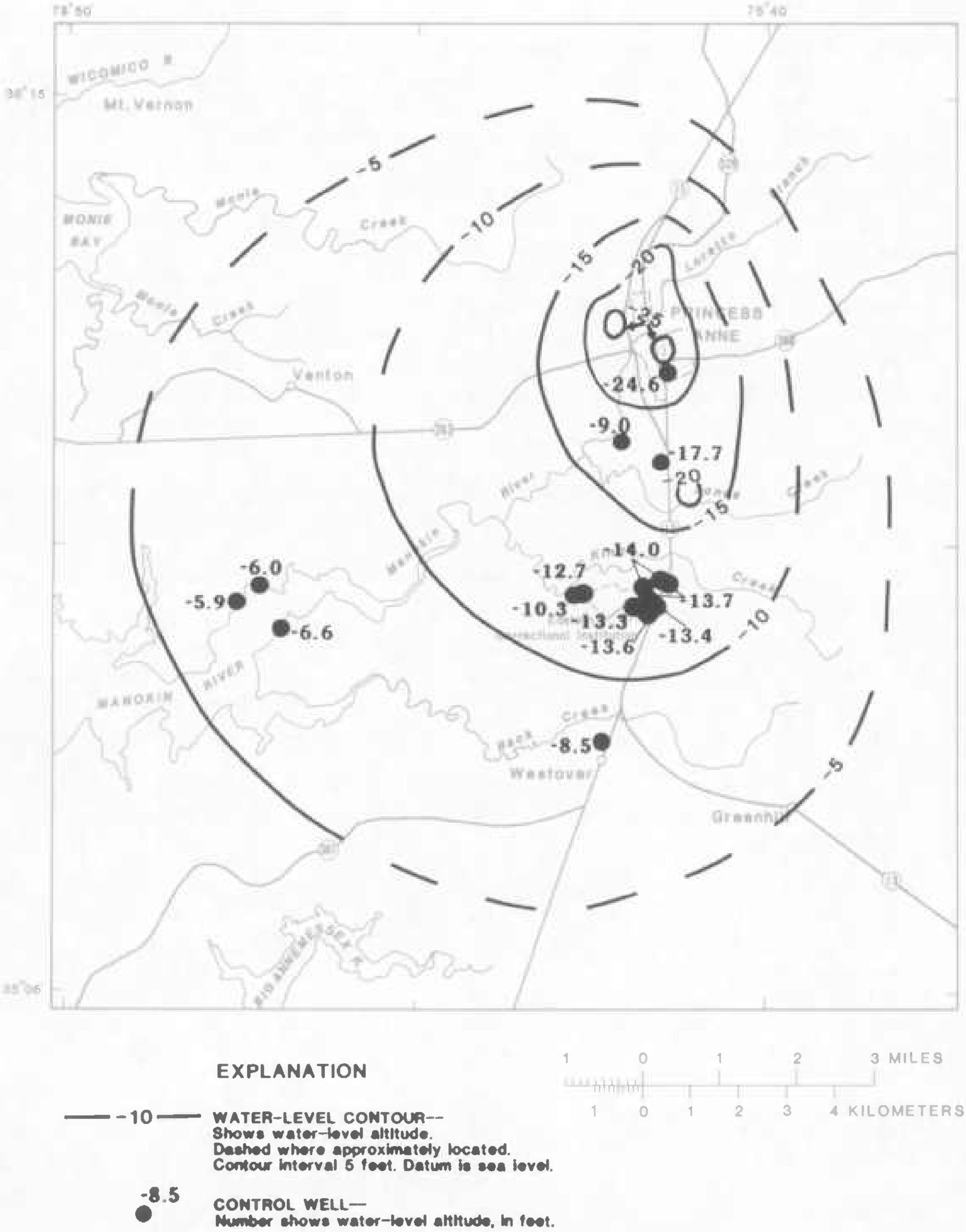



Figure 39.— Water-level altitudes in the Manokin aquifer in the Princess Anne area, November 1986.

unit, which was largely model derived, was changed by an order of magnitude, but transmissivity of the Manokin aquifer (layer 2) was changed by only 50 percent.

Table 9 lists the model inputs that were changed, the amount of variation, and the approximate water-level change in the area of interest resulting from the input change. The inputs that had the greatest effect on model results were vertical hydraulic conductivity of the confining unit and transmissivity of the Manokin aquifer (layer 2). Changes in these inputs resulted in water-level changes of up to 12 ft. The water-level changes generally were greatest near simulated pumping wells. The input that had the least effect on model results was the constant head specified for the surficial aquifer system and Pocomoke aquifer (layer 1); the magnitude of the water-level change was less than 2 ft.

Water levels and hydraulic conductances in the general-head boundaries also were varied to determine the effects of the boundaries on water levels in the area of interest. This is of particular concern in the model simulations involving increased ground-water withdrawals, because water levels in the external boundaries could change in response to stresses not accounted for in the calibrated model. Water levels in the general-head boundaries were varied by a factor of one-half. The resulting water-level change in the area of interest was between 1 and 7 ft. Changes in hydraulic conductance resulted in water-level changes of 1 to 5 ft.

TABLE 9
SENSITIVITY ANALYSIS OF MODEL INPUTS FOR THE CALIBRATED MODEL FOR THE PRINCESS ANNE AREA
[ft = feet; < = less than]

| Model input | Change in input | Approximate range of water-level change in layer 2, in ft (negative value indicates water-level decline) |
|---|---|---|
| Vertical hydraulic conductivity of confining unit | 10x | 5 to 12 |
| | .1x | -3 to -5 |
| Transmissivity | 1.5x | 1 to 12 |
| | .75x | -1 to -12 |
| Constant water level specified in layer 1 | 1.5x | 1 to 2 |
| | .5x | -1 to -2 |
| Water level in general-head boundaries | 1.5x | 2 to 9 |
| | .5x | -2 to -9 |
| Hydraulic conductance in general-head boundaries | 2x | 1 to 4 |
| | .5x | -1 to -5 |
| Southern boundary condition | no-flow to constant head at 1 ft | < 1 |

Finally, the boundary condition along the southern border of the model was changed from no-flow to a constant head of 1 ft. The resulting difference in water levels in the area of interest was less than 1 ft.

## Steady-state simulation of increased ground-water withdrawals from the Manokin aquifer

Ground-water withdrawals from the Manokin aquifer in the Princess Anne area are expected to increase by about 600,000 gal/d by the year 2000. This includes increased pumpage from the Princess Anne municipal wells, as well as pumpage from new wells installed for the Eastern Correctional Institution. Simulations of steady-state conditions were conducted for this increased pumping rate in the Manokin aquifer (layer 2). The pumpage distribution used for the simulation is shown in figure 33. Figure 40 depicts the resulting model-generated water levels in the Manokin. In the area of interest, water-level altitudes range from 80 ft below sea level near pumped wells to 10 ft below sea level at the model boundary. This represents water-level declines of 15 to 70 ft from 1986. Associated with the water-level declines is an increased hydraulic gradient between Westover and the pumped wells near Princess Anne. This suggests that water containing elevated chloride concentrations in the vicinity of Westover could migrate more quickly toward the pumping wells. Because of possible inaccuracies in aquifer properties and boundary conditions, and the doubt concerning the assumption of steady-state conditions, these results should be regarded as approximations only. Sensitivity analysis performed on the model indicates that errors in model inputs may impact simulated water levels considerably.

Table 10 lists the results of the sensitivity analysis for the model when increased pumpage from model layer 2 is included. The inputs that had the greatest effect on simulated water levels were vertical hydraulic conductivity of the overlying confining unit and transmissivity of the Manokin aquifer (layer 2). Variation of these inputs within reasonable limits results in water-level changes of up to 33 ft. For both inputs, water-level changes are greatest near the pumped wells and least near the boundaries of the area of interest. This indicates that errors in these inputs would affect the hydraulic gradient in the area of interest, as well as water levels.

The average linear velocity of ground water depends on the hydraulic conductivity of the sediments, their porosity, and the hydraulic gradient. They are related by the equation:

$$v = KI/n_e, \tag{5}$$

where: $v$ = average linear velocity, in feet per day;
$K$ = hydraulic conductivity, in feet per day;
$I$ = hydraulic gradient; and
$n_e$ = effective porosity.

The amount of time required for ground water to travel a specified distance may be determined by dividing the distance by the average linear velocity. The times required for high-chloride water in the vicinity of Westover to reach the nearest simulated pumped well at the Eastern Correctional Institution (well SO Ce 48) were estimated for the simulation of increased pumpage. An assumed effective porosity of 30 percent, a hydraulic conductivity of 13.2 ft/d, and hydraulic gradients derived from simulated water levels were used in the cal-


Figure 40.— Simulated water-level altitudes in the Manokin aquifer using projected pumpage.

TABLE 10
SENSITIVITY ANALYSIS OF MODEL INPUTS FOR THE SIMULATION OF
INCREASED PUMPAGE IN THE PRINCESS ANNE AREA
[ft = feet]

| Model input | Change in input | Approximate range of water-level change in layer 2, in ft (negative value indicates water-level decline) |
|---|---|---|
| Vertical hydraulic conductivity of confining unit | 10x | 15 to 33 |
| | .1x | -6 to -16 |
| Transmissivity | 1.5x | 2 to 27 |
| | .75x | -1 to -26 |
| Water level in layer 1 | 1.5x | 1 to 2 |
| | .5x | -1 to -2 |
| Water level in general-head boundaries | 1.5x | 2 to 9 |
| | .5x | -2 to -9 |
| Hydraulic conductance in general-head boundaries | 2x | 2 to 7 |
| | .5x | -3 to -10 |
| Southern boundary condition | no-flow to constant head at 1 ft | 1 to 2 |

culations. The results are listed in table 11. Using the linear hydraulic gradient between an isochlor and the nearest simulated pumped well, it would take about 50 years for water to move from the vicinity of the 250-mg/L isochlor to the well and about 300 years for water to move from the 500-mg/L isochlor to the well.

A more immediate concern is that as the high-chloride water moves northward, more of the aquifer becomes unsuitable as a source of potable water. Because the hydraulic gradient is steepest in the vicinity of a pumped well, ground-water velocity increases as water moves toward the nearest simulated pumped well. For example, the gradient near the simulated pumped well is about 0.013. Assuming an effective porosity of 0.30, the ground-water velocity is about 210 ft/yr, which is about 2-3 times greater than the average linear velocity.

There are several limitations to the above analysis. In the analysis, constant hydraulic conductivity was used. If there are zones of higher hydraulic conductivity in the aquifer, high-chloride water can flow more quickly through these zones and arrive at a pumped well more quickly than calculated. The other limitation is in the value used for effective porosity. This value was not measured directly, but represents a value typical of uniform sands (Bear, 1972, p. 46). Table 11 lists the average linear velocities and travel times using alternative ef-

TABLE 11
ESTIMATED TRAVEL TIMES AND AVERAGE LINEAR VELOCITIES OF GROUND WATER UNDER CONDITIONS OF SIMULATED INCREASED PUMPAGE IN THE PRINCESS ANNE AREA
[ft/yr = feet per year; mg/L = milligrams per liter]

| Effective porosity | Gradient | Average linear velocity (ft/yr) | Travel time (years) |
|---|---|---|---|
| From vicinity of 250-mg/L isochlor to nearest simulated pumped well (about 3,900 feet) | | | |
| 0.30 | 0.0051 | 80 | 49 |
| .20 | .0051 | 120 | 32 |
| .40 | .0051 | 61 | 64 |
| From vicinity of 500-mg/L isochlor to nearest simulated pumped well (about 13,000 feet) | | | |
| 0.30 | 0.0027 | 43 | 300 |
| .20 | .0027 | 66 | 190 |
| .40 | .0027 | 32 | 390 |

fective porosities of 20 and 40 percent. The result of decreasing effective porosity by one-third is to decrease the travel time by one third. Conversely, increasing the effective porosity by one-third increases the travel time by one-third.

In addition to water moving more rapidly from Westover to Princess Anne, water also will migrate more rapidly eastward toward Princess Anne in response to the increased ground-water withdrawals. The Manokin aquifer subcrops beneath the Chesapeake Bay; therefore, brackish water from the bay may migrate toward pumping centers more quickly as the pumpage increases. The simulated hydraulic gradient in the Manokin west of Princess Anne is about 5 ft/mi. Using this gradient and the values from the previous analysis, ground-water velocity in layer 2 west of the pumping centers is about 15 ft/yr.

The water budget generated by the model shows that under the increased-pumpage conditions, 72 percent of the water entering the Manokin aquifer is from general-head boundaries, and 28 percent is from leakage through the confining unit. Almost all of the water, 99 percent, leaves the modeled area by ground-water pumpage. The remaining 1 percent leaves by leakage to the upper layer.

## Estimated Effects of Projected Ground-Water Pumpage in the Crisfield Area

The town of Crisfield is the largest user of ground water in Somerset County. Present withdrawals are about 800,000 gal/d and are expected to increase to about 1,100,000 gal/d by the year 2000 (J. Windsor, Somerset County Department of Technical and Community

Services, written commun., 1986). Water supply is derived from the Paleocene and Potomac aquifer systems. Few multiple-well aquifer tests have been performed in the Crisfield area because of the cost of drilling deep observation wells, and little is known of the characteristics of the two aquifer systems outside the area. Due to the lack of available data, a detailed analysis using a digital-flow model of the possible effects of projected ground-water pumpage is not feasible. Therefore, an analytical solution was used to give an approximation of the additional water-level decline that may result from increased ground-water pumpage.

The Theis method is an analytical solution to the partial-differential equation that describes unsteady, radial flow in a confined aquifer (Theis, 1935; Freeze and Cherry, 1979, p. 317). The solution, in terms of drawdown, is:

$$h_o - h(r,t) = \frac{Q}{4\pi T} \int_u^\infty \frac{e^{-u}du}{u}, \qquad (6)$$

where: $u = r^2S/4Tt$;
$r$ = radial distance from the pumped well, in feet;
$t$ = time since pumping started, in days;
$Q$ = discharge rate of the pumped well, in cubic feet per day;
$h_o$ = head at $t=o$, in feet;
$h(r,t)$ = head at distance r (feet), and time t (days);
$T$ = transmissivity, in feet squared per day; and
$S$ = storage coefficient (dimensionless).

This investigation utilized a computer program that uses the Theis method to calculate water-level declines at specific distances from pumped wells at specified times (Walton, 1985). The program requires information on aquifer transmissivity, pumped-well locations, well discharges, storage coefficients, and time. Transmissivity was estimated from one multiple-well aquifer test and two single-well aquifer tests in the area. Transmissivity ranges from 1,050 to 2,140 $ft^2/d$, with an average of 1,490 $ft^2/d$. Storage coefficient from the multiple-well aquifer test is 0.0002. The high, low, and average transmissivity values were used in the analysis, resulting in a range of possible water-level declines.

A number of simplifying assumptions were necessary to use the method. These include:

(1) The aquifer is homogeneous and isotropic;
(2) ground-water flow is horizontal and radial toward pumped wells;
(3) vertical leakage to or from the aquifer is negligible;
(4) the aquifer is infinite in areal extent;
(5) ground-water discharge is by well withdrawals;
(6) water removed from storage is discharged instantaneously with declines in water levels; and
(7) the ground-water-flow system is initially under steady-state conditions.

Several of these assumptions are not met in the actual ground-water-flow system and may affect the accuracy of the results:

(1) The flow system at Crisfield actually consists of several aquifers and confining units. In the method, this complex system is simplified to one aquifer;
(2) leakage to or from the aquifer systems is unknown. If there is significant leakage, the water-level declines obtained from the computer program will be greater than actual declines; and

(3) the aquifer is not of infinite areal extent. The two aquifer systems exhibit complex geology in the area of interest. The aquifers in the systems may pinch out or become finer-grained a short distance from the wells, thereby significantly reducing the aquifer transmissivity. If this is the case, calculated water-level declines will be considerably less than actual declines.

Because the simplifying assumptions do not fully describe the aquifer systems, the values generated by the Theis method should be regarded as rough approximations of actual water-level declines.

Calculated water-level declines resulting from additional ground-water discharge are listed in table 12. These values represent additional declines in response to an additional ground-water discharge of 300,000 gal/d distributed between five pumped wells for a period of 20 years at the rates shown in figure 33. For example, if the calculated water-level decline is 20 ft and the initial water level is 18 ft below land surface, the resulting water level would be 38 ft below land surface. For a given range of water-level declines in table 12 the smaller value generally occurs near the edge of the area of interest, and the larger value occurs near pumped wells (fig. 33). In table 13, the largest declines, 13 to 31 ft, are associated with the smallest transmissivity. Likewise, the smallest declines, 7 to 16 ft, are associated with the largest transmissivity. Considering that water levels could decline about 900 ft before the top of the Paleocene aquifer system is reached, the estimates indicate that little of the available drawdown will be needed to meet the projected additional demand for water. However, because the characteristics of the aquifer systems are not known east of Crisfield, changes in the quality of the water that may result from the additional pumpage are not known.

To more accurately determine the effects of additional pumpage in the Crisfield area, more data are needed on aquifer characteristics, particularly in the area east of Crisfield. Specifically, more information is needed on:

(1) The degree of hydraulic connection between aquifers and the lateral extent of aquifers;
(2) hydraulic properties of aquifers and confining beds;
(3) the quality of water in the aquifers east of Crisfield;
(4) water levels in the aquifer; and
(5) rates and locations of ground-water withdrawal with time.

TABLE 12
WATER-LEVEL DECLINES RESULTING FROM INCREASED GROUND-WATER WITHDRAWALS IN THE CRISFIELD AREA, BASED ON AN ANALYTICAL SOLUTION
[$ft^2/d$ = feet squared per day; ft = feet]

| Transmissivity ($ft^2/d$) | Approximate range of water-level declines (ft) |
|---|---|
| 1,050 | 13 to 31 |
| 1,490 | 10 to 22 |
| 2,140 | 7 to 16 |

# SUMMARY AND CONCLUSIONS

Somerset County depends on ground water for approximately 84 percent of its water supply. An assessment of the ground-water resources was conducted because development in the county is expected to substantially increase the demand for ground water. In particular, the goals of the investigation were to:

(1) Refine the hydrogeologic framework;
(2) describe the quality of ground water; and
(3) evaluate the effects of projected ground-water withdrawals at Princess Anne and Crisfield on the ground-water-flow system.

Somerset County is underlain by a wedge of interbedded sands, silts, and clays that dip to the southeast. This wedge of generally unconsolidated sediments forms a series of aquifers and confining units. The aquifers receive water by the infiltration of precipitation, leakage from overlying and underlying aquifers, and by the lateral movement of water from outside the county. The aquifers and aquifer systems that can supply water to wells in Somerset County are:

(1) The surficial aquifer system;
(2) the Pocomoke aquifer;
(3) the Manokin aquifer;
(4) the Choptank aquifer;
(5) the Piney Point aquifer;
(6) the Paleocene aquifer system; and
(7) the Potomac aquifer system.

The uppermost water-producing unit is the surficial aquifer system. It is stratigraphically complex and exhibits rapid lithologic changes laterally and vertically. The aquifer system generally is coarser-grained and thicker in the northeastern part of the county and finer-grained and thinner in the remainder of the county. The aquifer system is used primarily to supply domestic wells, since the fine-grained nature and thinness of the system usually preclude its use as a source of water for high-yielding wells. The aquifer system in the northeastern part of the county may yield substantial quantities of water to wells, because of its thickness and coarse-grained nature.

The Pocomoke aquifer is present only in the southeastern part of the county. In some areas, the aquifer directly underlies the surficial aquifer system and receives water directly from it. The Pocomoke aquifer is used for domestic, irrigation, and industrial water supply. Reported specific capacities of wells in the aquifer range from 1 to 50 (gal/min)/ft. The median is 10 (gal/min)/ft.

In subcrop areas, water levels in the Pocomoke aquifer are probably adjusted to nearby surface-water bodies. In confined portions of the aquifer, water levels are less influenced by surface-water bodies.

The primary aquifer of use in Somerset County is the Manokin aquifer. It supplies water to domestic wells, the town of Princess Anne, the Eastern Correctional Institution, numerous poultry operations, and a plywood-manufacturing plant. The aquifer is not used extensively in the southern part of the county because chloride concentrations exceed the SMCL of 250 mg/L. Reported specific capacities range from 0.1 to 75 (gal/min)/ft; the median is 5.2 (gal/min)/ft. Transmissivity of the Manokin aquifer near Princess Anne, calculated from four multiple-well aquifer tests and a single-well aquifer test, ranges from 500 to 940 $ft^2/d$. Hydraulic conductivity ranges from 10.9 to 14.7 ft/d, with an average of 13.2 ft/d. Storage coefficient ranges from 0.0002 to 0.001.

Water levels in the Manokin aquifer have declined as much as 45 ft since the 1950's. Water-level altitudes throughout much of the county are below sea level, with the lowest altitudes located near the municipal wells at Princess Anne. Associated with the water-level declines are changes in ground-water-flow directions. Prior to heavy pumping, ground water generally flowed from northeast to southwest. Currently, ground water flows from the borders of the county toward pumped wells at Princess Anne. This change of flow direction could cause poor-quality water from the Chesapeake Bay or from the southern part of the county to migrate toward the pumping centers at Princess Anne.

The Choptank aquifer is capable of supplying large quantities of water to wells, but is not used for water supply because of water-quality concerns. Reported chloride concentrations exceed 900 mg/L, causing the water to be unacceptable for most uses.

The Piney Point aquifer supplies water to one well on Deal Island, and contributes water to a well at Crisfield that is screened in multiple aquifers. A single analysis indicates that although water in the aquifer has chloride concentrations within acceptable limits, it may contain dissolved solids in excess of 1,000 mg/L, which may make it undesirable as a source of potable water.

The Paleocene aquifer system is used only by the town of Crisfield as a source of public water supply. Two wells are screened entirely in the aquifer system, and the system contributes water to three other wells that are screened in multiple aquifers. The water-yielding capabilities of the Paleocene aquifer system are not well known. Reported specific capacities of two wells screened entirely in the aquifer were nearly 2 (gal/min)/ft. Transmissivity of a well screened in both the Paleocene and Potomac aquifer systems was estimated to be 1,050 $ft^2/d$. East of Crisfield, the extent and quality of water in the aquifer system are not known.

The Potomac aquifer system is used for public water supply by Crisfield, Smith Island, Rumbley, Frenchtown, and Fairmount. Reported specific capacities for four wells range from 1 to 7 (gal/min)/ft. Transmissivity and storage coefficient, calculated from a multi-well aquifer test are 2,140 $ft^2/d$ and 0.0002, respectively. Transmissivity estimated from one 24-hour, single-well aquifer test is 1,280 $ft^2/d$.

Water levels in the Potomac aquifer system in the Crisfield area are 8 to 18 ft below land surface. There is more than 950 ft of drawdown available; therefore, greater well yields are possible from the aquifer system. However, the extent and water quality of the producing aquifers are not known east of Crisfield. An electric log from a geothermal test well suggests that one or two additional aquifers may contain potable water.

The ground-water quality in Somerset County differs considerably, both laterally and vertically. Much of the county contains potable ground water, but there are areas where it is not possible to obtain water that meets drinking-water standards. South of Westover the Pocomoke aquifer contains iron concentrations in excess of the SMCL and the Manokin aquifer contains chloride concentrations in excess of the SMCL. Deeper aquifers probably are brackish east of Crisfield.

Chemical analyses of four water samples from the surficial aquifer system indicate the water is soft to moderately hard and slightly acidic. The water quality in the surficial aquifer system is likely to differ from site to site, because of the complex geology and the influence of land-use practices. In sites containing anoxic ground water or where unstable conditions exist, iron concentrations in excess of 300 $\mu g/L$ are likely. Nitrate contamination is possible in areas containing oxygenated ground water where the water can come into contact with nitrogen fertilizers or organic wastes.

Ground water from the subcrop areas of the Pocomoke aquifer is generally softer, contains fewer dissolved solids, and is more acidic than water in the confined parts of the aquifer. The confined parts of the aquifer generally contain greater concentrations of calcium and bicarbonate.

The most common water-quality problems in samples from the Pocomoke aquifer are iron and manganese concentrations in excess of the SMCL's. All but 2 of 24 samples exceed the limit for iron, and 18 of 24 exceed the limit for manganese. One sample exceeds the SMCL's for chloride and dissolved solids.

There is a marked areal difference in the quality of water from the Manokin aquifer. North of Westover, water from the aquifer is lower in dissolved solids, softer, and is a sodium bicarbonate type. South of Westover, the water contains more dissolved solids, is harder, and is a sodium chloride type. In the southern part of the county, chloride concentrations in the Manokin aquifer generally exceed the SMCL of 250 mg/L. This may be due to the presence of a transition zone or areas of low permeability that result in incomplete flushing of the aquifer. Dissolved iron is a problem in the northern part of the county. Iron concentrations generally are higher in the northeastern corner and decrease to the south and east.

Few wells produce water from the Choptank or Piney Point aquifers; therefore, little is known about the quality of the water in them. Reported chloride concentrations in the Choptank aquifer exceed 900 mg/L, and one sample from the Piney Point aquifer contained chloride concentrations less than 250 mg/L but had dissolved solids in excess of 1,000 mg/L.

Water from the Paleocene and Potomac aquifer systems is soft, has dissolved-solids concentrations ranging from 475 to 1,070 mg/L and has the highest pH of any aquifer in the county. The water from the two systems is of the sodium-bicarbonate type, with sodium accounting for more than 95 percent of the cations. The primary water-quality problem in the Paleocene and Potomac aquifer systems is high concentrations of fluoride. Seven of 10 water-quality samples contain concentrations of fluoride above the SMCL and two of these exceed the MCL.

The effects of projected ground-water pumpage were evaluated for the Princess Anne and Crisfield areas. A digital ground-water-flow model was used under steady-state conditions to evaluate the effects of current and projected pumpage from the Manokin aquifer in the vicinity of Princess Anne. The Theis solution was used to give a rough approximation of the effects of increased pumpage from the Paleocene and Potomac aquifer systems at Crisfield, because data necessary to construct a digital, ground-water-flow model for the Crisfield area were not available.

The aquifers in the Princess Anne area were represented by two model layers. The surficial aquifer system and the Pocomoke aquifer comprised layer 1 and the Manokin aquifer was represented by layer 2. Heads in layer 1 were held constant during the simulation, so that ground-water flow was simulated in layer 2 only. Flow through the confining unit overlying the Manokin aquifer was calculated from leakance values supplied to the model. Laterally, the model boundaries were no-flow on the southern boundary and general-head on the other three sides.

The model was calibrated to water levels measured in the Manokin aquifer during November 1986. The water budget generated by the model indicates that 74 percent of the water entering layer 2 is from general-head boundaries and 26 percent is from leakage through the confining unit. Ground-water withdrawal accounts for 97 percent of the water leaving the model layer.

Simulation of increased ground-water withdrawals from the Manokin aquifer of 600,000 gal/d resulted in water-level declines of 15 to 70 ft from current water levels. Associated with the additional water-level declines are increased ground-water velocities. Using model-derived velocities, it would take high-chloride water in the vicinity of the 250-mg/L isochlor 50 years to reach the pumped wells near Princess Anne. The travel time for water to move from the 500-mg/L isochlor to the nearest simulated pumped well is 300 years. These values are only approximations because of uncertainties in aquifer properties and simplifying assumptions. This does not account for possible zones of increased hydraulic conductivity along which the travel time would be shorter.

The water budget generated by the model shows that under increased pumping conditions, 72 percent of the water entering model layer 2 is from general-head boundaries and 28 percent is from vertical leakage. Almost all of the water, 99 percent, leaves the area by ground-water pumping.

Ground-water pumpage in the Crisfield area is expected to increase by 300,000 gal/d. In the solution used to determine the effect of this additional pumpage, the Paleocene and Potomac aquifer systems were simplified to one aquifer, and the aquifer was assumed to be infinite in areal extent. The storage coefficient of the aquifer was assumed to be 0.0002, a value obtained from a multiple-well aquifer test. Transmissivity values of 1,050, 1,490, and 2,140 $ft^2/d$ were used in the analysis. Additional water-level declines under these conditions ranged from 7 to 31 ft. The nature of the aquifer systems are unknown east of Crisfield; therefore, it is not known if high-chloride water would migrate toward the pumping centers at an increased rate because of additional pumpage.

## SELECTED REFERENCES

**Achmad, G. J., and Weigle, J. M.,** 1979, A quasi three-dimensional finite-difference ground-water flow model with a field application: Maryland Geological Survey Report of Investigations No. 33, 58 p.

**Andres, A. S.,** 1986, Stratigraphy and depositional history of the post-Choptank Chesapeake Group: Delaware Geological Survey Report of Investigations No. 42, 39 p.

**Bachman, L. J.,** 1984, Nitrate in the Columbia aquifer, Central Delmarva Peninsula, Maryland: U.S. Geological Survey Water-Resources Investigations Report 84-4322, 51 p.

**Bachman, L. J., and Wilson, J. M.,** 1984, The Columbia aquifer of the Eastern Shore of Maryland, Parts 1 and 2: Maryland Geological Survey Report of Investigations No. 40, 144 p.

**Back, William,** 1966, Hydrochemical facies and ground-water flow patterns in the northern part of the Atlantic Coastal Plain: U.S. Geological Survey Professional Paper 498-A, 42 p.

**Bear, Jacob,** 1972, Dynamics of fluids in porous media: New York, New York, American Elsevier.

**Boggess, D. H., and Heidel, S. G.,** 1968, Water resources of the Salisbury area, Maryland: Maryland Geological Survey Report of Investigations No. 3, 69 p.

**Brown, P. M., Miller, J. A., and Swain, F. M.,** 1972, Structural and stratigraphic framework and spatial distribution of permeability of the Atlantic Coastal Plain, North Carolina to New York: U.S. Geological Survey Professional Paper 796, 79 p.

**Cushing, E. M., Kantrowitz, I. H., and Taylor, K. R.,** 1973, Water resources of the Delmarva Peninsula: U.S. Geological Survey Professional Paper 822, 58 p.

**Dashevsky, S. S., and McClung, W. S.,** 1979, Summary of temperature logging of Crisfield, Maryland geothermal test hole *in* Evaluation and targeting of geothermal energy resources in the southeastern United States, *ed.* J. K. Costain and others: Virginia Polytechnic and State University Progress Report 78ET-27001-7, p. A22-29.

**Denver, J. M.,** 1986, Hydrogeology and geochemistry of the unconfined aquifer, west-central and southwestern Delaware: Delaware Geological Survey Report of Investigations No. 41, 100 p.

**Drever, J. I.,** 1982, The geochemistry of natural waters: Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 388 p.

**Driscoll, F. G.,** 1986, Groundwater and wells (2nd ed.): St. Paul, Minnesota, Johnson Division, 1089 p.

**Fetter, C. W.,** 1988, Applied hydrogeology (2nd ed.): Columbus, Ohio, Merrill Publishing Company, 592 p.

**Foster, M. D.,** 1950, The origin of high sodium bicarbonate waters in the Atlantic and Gulf Coastal Plains: Geochimica et Cosmochimica Acta, v. 1, p. 33-48.

**Freeze, A. R., and Cherry, J. A.,** 1979, Groundwater: Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 604 p.

**Hansen, H. J.,** 1966, Pleistocene stratigraphy of the Salisbury area, Maryland and its relationship to the lower Eastern Shore: A subsurface approach: Maryland Geological Survey Report of Investigations No. 2, 56 p.

______ 1967, Hydrogeologic data from the Janes Island State Park test well (1,514 feet) Somerset County, Maryland: Maryland Geological Survey Basic Data Report No. 3, 24 p.

______ 1972, A user's guide for artesian aquifers of the Maryland Coastal Plain, Part II: Aquifer characteristics: Maryland Geological Survey, 123 p.

______ 1978, Upper Cretaceous (Senonian) and Paleocene (Danian) pinchouts on the south flank of the Salisbury Embayment, Maryland, and their relationship to antecedent basement structures: Maryland Geological Survey Report of Investigations No. 29, 34 p.

______ 1981, Stratigraphic discussion in support of a major unconformity separating the Columbia Group from the underlying upper Miocene aquifer complex in eastern Maryland: Southeastern Geology, v. 22, no. 3, p. 123-138.

______ 1982, Hydrogeologic framework and potential utilization of the brine aquifers of the Waste Gate Formation, a new unit of the Potomac Group underlying the Delmarva Peninsula *in* Waste Gate Formation, Part One: Maryland Geological Survey Open-File Report No. 82-02-1, p. 1-50.

**Hansen, H. J., and Wilson, J. M.,** 1990, Hydrogeology and stratigraphy of a 1,515 foot test well drilled near Princess Anne, Somerset County, Maryland: Maryland Geological Survey Open-File Report No. 91-02-5, 59 p.

**Hem, J. D.,** 1985, Study and interpretation of the chemical characteristics of natural water (3rd ed.): U.S. Geological Survey Water-Supply Paper 2254, 263 p.

**Hodges, A. L.,** 1984, Hydrology of the Manokin, Ocean City, and Pocomoke aquifers of southeastern Delaware: Delaware Geological Survey Report of Investigations No. 38, 60 p.

**Johnston, R. H.,** 1976, Relation of ground water to surface water in four small basins of the Delaware Coastal Plain: Delaware Geological Survey Report of Investigations No. 24, 56 p.

**Keys, W. S., and MacCary, L. M.,** 1983, Application of borehole geophysics to water-resources investigations: Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 2, Chapter E1, 126 p.

**Knobel, L. L.,** 1985, Ground-water-quality data for the Atlantic Coastal Plain: New Jersey, Delaware, Maryland, Virginia and North Carolina: U.S. Geological Survey Open-File Report 85-154, 84 p.

**Kula, Katherine, and Hansen, H. J.,** 1989, Fluoride supplementation and the concentration of fluoride in ground water from eastern and southern Maryland: Journal of the Maryland State Dental Association, v. 32, no. 3, p. 16-23.

**Laney, R. L., and Davidson, C. B.,** 1986, Aquifer-nomenclature guidelines: U.S. Geological Survey Open-File Report 86-534, 45 p.

**Langmuir, Donald,** 1969, Geochemistry of iron in coastal-plain ground water of the Camden, New Jersey area: U.S. Geological Survey Professional Paper 650-C, p. C224-C235.

**Lohman, S. W.,** 1972, Ground-water hydraulics: U.S. Geological Survey Professional Paper 708, 70 p.

**Maryland Department of State Planning,** 1973, Natural soil groups technical report: Maryland Department of State Planning, Baltimore, Md., 151 p.

______ 1974, Natural soil groups Somerset County: Maryland Department of State Planning, Baltimore, Md., scale 1:63,360.

**McDonald, M. G., and Harbaugh, A. W.,** 1988, A modular three-dimensional finite-difference ground-water flow model: Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 6, Chapter A1, 586 p.

**Mixon, R. B.,** 1985, Stratigraphic and geomorphic framework of uppermost Cenozoic deposits in the southern Delmarva Peninsula, Virginia and Maryland: U.S. Geological Survey Professional Paper 1067-G, 53 p.

**National Oceanic and Atmospheric Administration,** 1949-86, Climatological data for Maryland and Delaware, Annual Summary: U.S. Department of Commerce, National Climatic Data Center, Asheville, North Carolina (published annually).

**Owens, J. P., and Denny, C. S.,** 1979, Upper Cenozoic deposits of the central Delmarva Peninsula, Maryland and Delaware: U.S. Geological Survey Professional Paper 1067-A, 28 p.

______ 1984, Geologic map of Somerset County: Maryland Geological Survey, scale 1:62,500.

**Pickett, T. E.,** 1976, Generalized geologic map of Delaware: Delaware Geological Survey, scale 1:576,000.

**Rasmussen, W. C., and Andreasen, G. E.,** 1959, Hydrologic budget of the Beaverdam Creek basin, Maryland: U.S. Geological Survey Water-Supply Paper 1472, 106 p.

**Rasmussen, W. C., and Slaughter, T. H.,** 1955, The ground-water resources of Somerset, Wicomico, and Worcester Counties: Maryland Department of Geology, Mines and Water Resources Bulletin 16, 533 p.

**Reilly, T. E., Franke, O. L., and Bennett, G. D.**, 1984, The principle of superposition and its application in ground-water hydraulics: U.S. Geological Survey Open-File Report 84-459, 36 p.

**Skougstad, M. W., Fishman, M. J., Friedman, L. C., Erdmann, D. E., and Duncan, S. S.**, 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water Resources Investigations, Book 5, Chapter A1, 626 p.

**Theis, C. V.**, 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage: American Geophysical Union Transactions, v. 16, p. 519-524.

**U.S. Department of Agriculture**, 1966, Soil survey of Somerset County, Maryland: U.S. Department of Agriculture Soil Conservation Service, 90 p.

**U.S. Department of Commerce**, 1981, Census of population and housing, final population and housing units counts, Maryland: Washington, D.C., U.S. Bureau of the Census, U.S. Government Printing Office, 12 p.

**U.S. Environmental Protection Agency**, 1977a, National interim primary drinking water regulations: U.S. Environmental Protection Agency Publication 570/9-76-003, 159 p.

______ 1977b, National secondary drinking water regulations: Federal Register, v. 42, no. 62, March 31, p. 17,143-47.

______ 1986a, Maximum contaminant levels (subpart B of part 141, National interim primary drinking-water regulations): U.S. Code of Federal Regulations, Title 40, parts 100 to 149, revised July 1, 1986: U.S. Environmental Protection Agency, Washington, D.C., p. 524-528.

______ 1986b, Secondary maximum contaminant levels (section 143.3, of part 143, National secondary drinking-water regulations): U.S. Code of Federal Regulations, Title 40, parts 100 to 149, revised July 1, 1986: U.S. Environmental Protection Agency, Washington, D.C., p. 587-590.

**Walton, W. C.**, 1985, Thirty-five basic groundwater programs for desktop microcomputers: International Ground Water Modeling Center, Indianapolis, Indiana, 217 p.

**Weigle, J. M.**, 1974, Availability of fresh ground water in northeastern Worcester County, Maryland: with special emphasis on the Ocean City area: Maryland Geological Survey Report of Investigations No. 24, 64 p.

**Weigle, J. M., Webb, W. E., and Gardner, R. A.**, 1970, Water resources of southern Maryland: U.S. Geological Survey Hydrologic Atlas HA-365.

**Wolff, R. G.**, 1970, Field and laboratory determination of the hydraulic diffusivity of a confining bed: Water Resources Research, v. 6, no. 1, p. 194-203.

# SUPPLEMENTAL DATA

TABLE 13
CHEMICAL ANALYSES OF GROUND WATER IN SOMERSET COUNTY—explanation of codes

Aquifer codes

| | |
|---|---|
| 112PCPC | Surficial aquifer system |
| 122MOCN | Miocene series (undifferentiated) |
| 122PCMK | Pocomoke aquifer |
| 122MNKN | Manokin aquifer |
| 122CPNK | Choptank aquifer |
| 124PNPN | Piney Point aquifer |
| 125PLCN | Paleocene aquifer system |
| 217PTMC | Potomac aquifer system |

TABLE 13

CHEMICAL ANALYSES OF GROUND WATER IN SOMERSET COUNTY—Continued

[μS/cm = microsiemens per centimeter; deg C = degrees Celsius; mg/L = milligrams per liter; < = less than; -- = no data]

| Well no. | Aquifer | Date | Specific conductance laboratory (μS/cm) | pH field (standard units) | Water temperature (deg C) | Hardness (mg/L as $CaCO_3$) | Oxygen, dissolved (mg/L) | Calcium, dissolved (mg/L as Ca) | Magnesium, dissolved (mg/L as Mg) |
|---|---|---|---|---|---|---|---|---|---|
| SO Ad 13 | 122MNKN | 09-10-86 | 364 | 6.8 | 17.0 | 88 | 0.2 | 23 | 7.4 |
| SO Ae 16 | 122PCMK | 08-05-86 | 172 | 4.6 | 15.5 | 53 | 6.9 | 8.3 | 7.9 |
| SO Ae 17 | 112PCPC | 09-10-86 | 174 | 5.4 | 16.0 | 59 | -- | 5.5 | 11 |
| SO Ae 18 | 122MNKN | 09-10-86 | 255 | 6.8 | 17.0 | 59 | 0 | 15 | 5.2 |
| SO Af 20 | 122MNKN | 08-05-86 | 309 | 6.6 | 23.0 | 97 | -- | 27 | 7.2 |
| SO Bb 15 | 122MNKN | 08-06-86 | 1,530 | 6.8 | 19.0 | 220 | 0 | 43 | 28 |
| SO Bb 19 | 124PNPN | 08-06-86 | 1,950 | 7.6 | 20.5 | 33 | 0 | 6.1 | 4.2 |
| SO Bc 15 | 122MNKN | 08-06-86 | 1,890 | 7.5 | 19.0 | 130 | 0 | 24 | 18 |
| SO Bd 33 | 122MNKN | 08-06-86 | 355 | 6.6 | 18.0 | 34 | 0 | 7.5 | 3.8 |
| SO Bd 37 | 112PCPC<br>122MNKN | 06-26-86 | 366 | 6.6 | 15.0 | 140 | -- | 41 | 9.1 |
| SO Bd 39 | 122MNKN | 08-07-86 | 907 | 7.6 | 16.5 | 47 | .5 | 9.6 | 5.6 |
| SO Be 14 | 122MNKN | 12-08-52 | 784 | 8.2 | -- | 52 | -- | 13 | 4.7 |
| SO Be 49 | 122PCMK | 12-08-52 | 249 | 5.8 | -- | 51 | -- | 12 | 5.1 |
| SO Be 51 | 122MNKN | 08-28-86 | 703 | 7.8 | 16.0 | 40 | -- | 8.2 | 4.7 |
| SO Be 54 | 122MNKN | 08-28-86 | 732 | 8.0 | 16.0 | 42 | 0 | 8.8 | 4.9 |
| SO Be 56 | 122MNKN | 08-28-86 | 916 | 7.8 | 16.5 | 47 | 0 | 9.0 | 6.0 |
| SO Be 58 | 122MNKN | 08-07-86 | 829 | 7.9 | 21.0 | 44 | -- | 8.4 | 5.5 |
| SO Be 72 | 122PCMK | 08-07-86 | 310 | 6.5 | 16.0 | 26 | 0 | 4.6 | 3.6 |
| SO Be 77 | 122PCMK | 07-29-86 | 310 | 4.5 | 16.0 | 49 | 0 | 8.5 | 6.7 |
| SO Be 83 | 122MNKN | 08-05-86 | 552 | 7.7 | 17.5 | 45 | -- | 10 | 4.8 |
| SO Be 84 | 122MNKN | 08-05-86 | 542 | 7.4 | 18.0 | 32 | -- | 4.7 | 4.9 |
| SO Be 86 | 122MNKN | 08-12-86 | 977 | 7.8 | 17.0 | 60 | 2.0 | 12 | 7.2 |
| SO Be 87 | 122PCMK | 07-29-86 | 99 | 5.6 | 16.5 | 11 | 0 | 2.4 | 1.2 |
| SO Be 88 | 122PCMK | 08-06-86 | 226 | 4.9 | 16.5 | 56 | 1.0 | 11 | 6.8 |
| SO Be 89 | 122PCMK | 08-06-86 | 165 | 5.1 | 16.5 | 16 | 0 | 2.6 | 2.3 |
| SO Be 91 | 122MNKN | 08-07-86 | 737 | 7.7 | 18.0 | 37 | -- | 6.9 | 4.7 |
| SO Be 92 | 122MNKN | 09-05-86 | 442 | 6.6 | 18.0 | 36 | -- | 8.2 | 3.8 |
| SO Be 93 | 122MNKN | 09-05-86 | 1,040 | 7.7 | 17.5 | 2 | -- | .40 | .20 |
| SO Be 94 | 122PCMK | 09-08-86 | 143 | 6.0 | 17.0 | 20 | 0 | 3.2 | 2.9 |
| SO Be 95 | 122MNKN | 09-08-86 | 840 | 7.4 | 16.5 | 46 | .2 | 8.5 | 5.9 |
| SO Bf 14 | 122MNKN | 08-07-86 | 630 | 7.9 | 18.0 | 39 | 0 | 8.3 | 4.3 |
| SO Bf 15 | 122MNKN | 08-07-86 | 439 | 8.2 | 16.5 | 43 | 0 | 9.9 | 4.5 |
| SO Bf 17 | 122MNKN | 08-07-86 | 387 | 7.8 | 16.5 | 78 | 0 | 19 | 7.3 |
| SO Bf 18 | 122MNKN | 08-08-86 | 420 | 7.6 | -- | 51 | 0 | 12 | 5.0 |
| SO Bf 20 | 112PCPC | 08-07-86 | 285 | 5.5 | 15.0 | 79 | -- | 16 | 9.5 |
| SO Cb 24 | 122MNKN | 09-04-86 | 1,590 | 7.1 | 17.5 | 170 | -- | 29 | 24 |
| SO Cc 6 | 217PTMC | 09-04-86 | 1,160 | -- | 27.5 | 6 | -- | 1.4 | .60 |
| SO Cc 7 | 217PTMC | 04-03-70 | 1,240 | 8.5 | 24.5 | 6 | -- | 1.4 | .70 |
| SO Cd 41 | 217PTMC | 05-29-79 | 1,000 | 8.3 | -- | 6 | -- | 1.6 | .60 |
| | | 05-29-79 | 1,000 | 8.3 | -- | 6 | -- | 1.7 | .50 |
| | | 05-30-79 | 1,000 | 8.4 | -- | 6 | -- | 1.6 | .60 |
| | | 09-04-86 | 948 | 8.7 | 27.0 | 6 | 0 | 1.5 | .60 |
| SO Cd 44 | 122PCMK | 08-14-86 | 242 | 5.6 | 16.5 | 68 | 0 | 17 | 6.2 |
| SO Cd 45 | 122PCMK | 08-14-86 | 158 | 5.8 | 15.5 | 33 | 0 | 8.8 | 2.6 |
| SO Cd 49 | 122MNKN | 07-29-86 | 2,060 | 7.7 | 22.5 | 130 | .7 | 25 | 17 |
| SO Cd 50 | 122MNKN | 09-03-86 | 1,570 | 7.0 | 17.5 | 260 | -- | 63 | 24 |
| SO Cd 51 | 122MNKN | 07-31-86 | 2,520 | 7.7 | 19.0 | 190 | 0 | 35 | 25 |
| SO Cd 52 | 122PCMK | 08-14-86 | 456 | 5.5 | 16.5 | 46 | 0 | 8.6 | 5.9 |
| SO Ce 53 | 122MNKN | 08-12-86 | 737 | 7.3 | 20.5 | 83 | 0 | 21 | 7.3 |
| SO Ce 56 | 122MNKN | 08-08-86 | 3,290 | 7.8 | 16.5 | 230 | 0 | 41 | 32 |
| SO Ce 64 | 122MOCN | 08-12-86 | 1,290 | 7.7 | 22.0 | 120 | 3.3 | 21 | 17 |
| SO Ce 65 | 122MNKN | 08-08-86 | 1,930 | 7.6 | 17.0 | 130 | 0 | 24 | 16 |

| Sodium, dissolved (mg/L as Na) | Potassium, dissolved (mg/L as K) | Alkalinity, carbonate field (mg/L as $CaCO_3$) | Sulfate, dissolved (mg/L as $SO_4$) | Chloride, dissolved (mg/L as Cl) | Fluoride, dissolved (mg/L as F) | Silica, dissolved (mg/L as $SiO_2$) | Solids, at 180 deg C dissolved (mg/L) | Nitrogen, ammonia dissolved (mg/L as N) | Well no. |
|---|---|---|---|---|---|---|---|---|---|
| 43 | 5.1 | 190 | 1.7 | 15 | 0.30 | 20 | 220 | 0.220 | SO Ad 13 |
| 6.5 | 2.3 | -- | 25 | 14 | < .10 | 13 | 100 | .020 | SO Ae 16 |
| 5.1 | 2.0 | 5.5 | 27 | 14 | < .10 | 12 | 108 | < .010 | SO Ae 17 |
| 31 | 4.2 | 140 | 4.4 | 7.1 | .30 | 26 | 173 | .150 | SO Ae 18 |
| 25 | 4.3 | 158 | 2.3 | 5.8 | .20 | 22 | 184 | .150 | SO Af 20 |
| 210 | 19 | 320 | 12 | 320 | .20 | 38 | 846 | 2.40 | SO Bb 15 |
| 400 | 13 | 772 | 68 | 180 | 2.3 | 23 | 1,180 | .600 | SO Bb 19 |
| 340 | 17 | 450 | 58 | 330 | .30 | 11 | 1,070 | .960 | SO Bc 15 |
| 62 | 6.4 | 356 | 3.4 | 11 | .20 | 24 | 226 | .230 | SO Bd 33 |
| 14 | 2.3 | 84 | 79 | 21 | .30 | 17 | 236 | .150 | SO Bd 37 |
| 180 | 8.6 | 380 | 11 | 74 | .30 | 11 | 537 | .340 | SO Bd 39 |
| 150 | 10 | 304 | 18 | 62 | .40 | 14 | 460 | -- | SO Be 14 |
| 24 | 4.2 | 22 | 52 | 24 | .20 | 26 | 161 | -- | SO Be 49 |
| 150 | 6.8 | 305 | 10 | 47 | .40 | 11 | 593 | .290 | SO Be 51 |
| 150 | 6.8 | 305 | 14 | 54 | .40 | 11 | 404 | .280 | SO Be 54 |
| 190 | 8.1 | 345 | 10 | 93 | .40 | 10 | 524 | .380 | SO Be 56 |
| 170 | 7.9 | 319 | 7.9 | 72 | .40 | 10 | 491 | .330 | SO Be 58 |
| 56 | 5.7 | 152 | 7.6 | 7.7 | .40 | 39 | 220 | .180 | SO Be 72 |
| 14 | 2.6 | 0 | 69 | 18 | < .10 | 29 | 160 | .240 | SO Be 77 |
| 110 | 5.9 | 272 | 3.2 | 20 | .40 | 12 | 332 | .250 | SO Be 83 |
| 110 | 5.6 | 264 | 3.0 | 20 | .30 | 150 | 329 | .220 | SO Be 84 |
| 210 | 9.5 | 410 | 19 | 110 | .40 | 11 | 599 | .370 | SO Be 86 |
| 13 | 1.5 | 26 | 14 | 9.3 | < .10 | 27 | 90 | .060 | SO Be 87 |
| 12 | 2.1 | 4.0 | 55 | 19 | .10 | 24 | 150 | .030 | SO Be 88 |
| 6.4 | 25 | 9.0 | 45 | 10 | < .10 | 14 | 108 | .040 | SO Be 89 |
| 150 | 7.5 | 405 | 4.1 | 51 | .40 | 68 | 435 | .290 | SO Be 91 |
| 90 | 4.4 | 240 | 3.7 | 12 | .50 | 16 | 276 | .200 | SO Be 92 |
| 230 | 1.5 | 355 | 19 | 120 | .40 | 9.8 | 620 | .120 | SO Be 93 |
| 20 | 2.2 | 61 | 8.5 | 10 | .40 | 38 | 131 | .220 | SO Be 94 |
| 180 | 7.5 | 350 | 10 | 78 | .50 | 11 | 544 | .370 | SO Be 95 |
| 129 | 5.6 | 301 | 5.3 | 28 | .30 | 10 | 378 | .220 | SO Bf 14 |
| 76 | 5.9 | 230 | 2.1 | 12 | .30 | 12 | 262 | .180 | SO Bf 15 |
| 53 | 6.1 | 200 | 1.0 | 7.0 | .20 | 14 | 230 | .200 | SO Bf 17 |
| 74 | 5.0 | 220 | 1.6 | 6.7 | .20 | 14 | 250 | .190 | SO Bf 18 |
| 13 | 8.8 | 13 | 40 | 22 | < .10 | 12 | 178 | .260 | SO Bf 20 |
| 270 | 19 | 375 | 6.1 | 300 | .10 | 24 | 847 | 2.30 | SO Cb 24 |
| 270 | 6.7 | 660 | 23 | 6.7 | 4.8 | 12 | 710 | .130 | SO Cc 6 |
| 300 | 7.0 | 635 | 24 | 6.2 | 5.2 | 12 | 766 | -- | SO Cc 7 |
| 260 | 5.8 | 510 | 27 | 7.7 | 2.6 | 12 | 613 | -- | SO Cd 41 |
| 240 | 7.4 | 510 | 27 | 8.1 | 2.6 | 11 | 611 | -- | |
| 220 | 6.1 | 520 | 30 | 8.0 | 2.6 | 12 | 629 | -- | |
| 230 | 5.5 | 530 | 24 | 7.4 | 2.5 | 12 | 580 | .420 | |
| 16 | 2.3 | 60 | 59 | 16 | .20 | 76 | 242 | .900 | SO Cd 44 |
| 15 | 3.0 | 51 | 16 | 15 | .20 | 21 | 123 | .280 | SO Cd 45 |
| 370 | 16 | 395 | 110 | 370 | .20 | 10 | 1,190 | .820 | SO Cd 49 |
| 210 | 15 | 210 | 47 | 350 | .20 | 17 | 807 | .350 | SO Cd 50 |
| 460 | 19 | 405 | 110 | 490 | .20 | 10 | 1,430 | 1.00 | SO Cd 51 |
| 49 | 2.2 | 60 | 63 | 72 | .10 | 33 | 287 | .100 | SO Cd 52 |
| 140 | 7.6 | 295 | 21 | 63 | .30 | 21 | 464 | .390 | SO Ce 53 |
| 590 | 24 | 430 | 140 | 770 | .20 | 9.9 | 1,860 | 1.40 | SO Ce 56 |
| 240 | 18 | 400 | 16 | 210 | .10 | 14 | 770 | .050 | SO Ce 64 |
| 350 | 16 | 300 | 98 | 340 | .20 | 9.8 | 1,100 | .890 | SO Ce 65 |

TABLE 13
CHEMICAL ANALYSES OF GROUND WATER IN SOMERSET COUNTY--Continued
[deg C = degrees Celsius; mg/L = milligrams per liter;
µg/L = micrograms per liter; < = less than; -- = no data]

| Well no. | Nitrogen, ammonia plus organic dissolved (mg/L as N) | Nitrogen, $NO_2 + NO_3$ dissolved (mg/L as N | Phos- phorus, dis- solved (mg/L as P) | Barium, dis- solved (µg/L as Ba) | Beryl- lium, dis- solved (µg/L as Be) | Boron, dis- solved (µg/L as B | Cadmium, dis- solved (µg/L as Cd) | Cobalt, dis- solved (µg/L as Co) | Copper, dis- solved (µg/L as Cu) |
|---|---|---|---|---|---|---|---|---|---|
| SO Ad 13 | 0.40 | <0.100 | 0.270 | 23 | <0.5 | 150 | <1 | <3 | <10 |
| SO Ae 16 | .40 | 6.30 | .040 | 92 | < .5 | 20 | 1 | 4 | 10 |
| SO Ae 17 | .70 | 5.70 | .020 | 48 | < .5 | 20 | <1 | <3 | <10 |
| SO Ae 18 | .40 | < .100 | .270 | 20 | < .5 | 100 | <1 | <3 | <10 |
| SO Af 20 | .30 | < .100 | .370 | 18 | < .5 | 110 | <1 | <3 | <10 |
| SO Bb 15 | 2.3 | < .100 | .410 | 36 | < .5 | 780 | 2 | <3 | <10 |
| SO Bb 19 | .70 | < .100 | .040 | 10 | < .5 | 3,000 | <1 | <3 | <10 |
| SO Bc 15 | 1.1 | < .100 | .180 | 32 | < .5 | 1,200 | 4 | <3 | <10 |
| SO Bd 33 | .30 | < .100 | .690 | 15 | < .5 | 190 | <1 | <3 | <10 |
| SO Bd 37 | .30 | < .100 | < .010 | 37 | < .5 | 20 | 1 | <3 | <10 |
| SO Bd 39 | .60 | < .100 | .350 | 18 | < .5 | 560 | <1 | <3 | <10 |
| SO Be 14 | -- | -- | -- | -- | -- | -- | -- | -- | 40 |
| SO Be 49 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Be 51 | .40 | .100 | .470 | 12 | < .5 | 410 | 2 | <3 | <10 |
| SO Be 54 | .40 | < .100 | .460 | 14 | 2 | 450 | 3 | <3 | <10 |
| SO Be 56 | .50 | < .100 | .340 | 13 | .6 | 600 | 2 | <3 | <10 |
| SO Be 58 | .60 | < .100 | .400 | 14 | < .5 | 520 | <1 | <3 | <10 |
| SO Be 72 | .40 | < .100 | 1.60 | 20 | < .5 | 120 | <1 | <3 | <10 |
| SO Be 77 | .50 | < .100 | .010 | 160 | 2 | 20 | <1 | <3 | <10 |
| SO Be 83 | .40 | < .100 | .610 | 14 | < .5 | 260 | <1 | <3 | 10 |
| SO Be 84 | .50 | < .100 | .620 | 16 | < .5 | 250 | <1 | <3 | <10 |
| SO Be 86 | .50 | < .100 | .360 | 15 | < .5 | 670 | <1 | <3 | <10 |
| SO Be 87 | < .20 | < .100 | .020 | 16 | < .5 | 20 | <1 | <3 | <10 |
| SO Be 88 | < .20 | 1.20 | .010 | 75 | .9 | 10 | <1 | 70 | <10 |
| SO Be 89 | .30 | .150 | < .010 | 38 | < .5 | 30 | <1 | <3 | <10 |
| SO Be 91 | .60 | < .100 | .420 | 12 | < .5 | 480 | <1 | <3 | <10 |
| SO Be 92 | < .20 | < .100 | .820 | 17 | < .5 | 220 | <1 | <3 | <10 |
| SO Be 93 | 2.2 | < .100 | .370 | 11 | < .5 | 670 | 1 | <3 | <10 |
| SO Be 94 | .30 | < .100 | .720 | 27 | < .5 | 40 | 3 | <3 | <10 |
| SO Be 95 | .60 | < .100 | .370 | 15 | < .5 | 540 | 1 | <3 | <10 |
| SO Bf 14 | .50 | < .100 | .380 | 14 | < .5 | 350 | <1 | <3 | <10 |
| SO Bf 15 | .30 | < .100 | .410 | 14 | < .5 | 240 | <1 | <3 | <10 |
| SO Bf 17 | .40 | < .100 | .300 | 18 | < .5 | 170 | <1 | <3 | <10 |
| SO Bf 18 | .40 | < .100 | .400 | 16 | < .5 | 200 | <1 | <3 | <10 |
| SO Bf 20 | .70 | < .100 | .010 | 110 | < .5 | 40 | <1 | <3 | 10 |
| SO Cb 24 | 2.8 | < .100 | 2.10 | 16 | < .5 | 840 | <1 | <3 | <10 |
| SO Cc 6 | .30 | < .100 | .240 | 36 | .5 | 2,000 | <1 | <3 | <10 |
| SO Cc 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Cd 41 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | <100 | -- | 1,100 | -- | 2 | -- |
| | .70 | < .100 | .290 | 28 | .6 | 1,200 | <1 | <3 | <10 |
| SO Cd 44 | 1.0 | < .100 | .130 | 27 | < .5 | 40 | 2 | <3 | <10 |
| SO Cd 45 | .40 | < .100 | .010 | 26 | < .5 | 20 | <1 | <3 | <10 |
| SO Cd 49 | 1.0 | < .100 | .140 | 27 | < .5 | 1,200 | 5 | <3 | <10 |
| SO Cd 50 | .60 | < .100 | .010 | 54 | < .5 | 430 | 7 | <3 | <10 |
| SO Cd 51 | 1.2 | < .100 | .120 | 40 | <2 | 1,300 | 7 | <9 | <30 |
| SO Cd 52 | < .20 | < .100 | .020 | 48 | < .5 | 30 | 3 | <3 | <10 |
| SO Ce 53 | .90 | < .100 | .520 | 15 | < .5 | 420 | <1 | <3 | <10 |
| SO Ce 56 | 1.5 | < .100 | .130 | 43 | 5 | 1,600 | 4 | <9 | <30 |
| SO Ce 64 | .30 | .680 | .110 | 22 | < .5 | 980 | <1 | <3 | 40 |
| SO Ce 65 | .90 | < .100 | .150 | 24 | < .5 | 1,100 | 2 | <3 | <10 |

| Iron, dis-solved (µg/L as Fe) | Lead, dis-solved (µg/L as Pb) | Lithium, dis-solved (µg/L as Li) | Manga-nese, dis-solved (µg/L as Mn) | Molyb-denum, dis-solved (µg/L as Mo) | Stron-tium, dis-solved (µg/L as Sr) | Vana-dium, dis-solved (µg/L as V) | Zinc, dis-solved (µg/L as Zn) | Well no. |
|---|---|---|---|---|---|---|---|---|
| 1,400 | <10 | 15 | 67 | <10 | 210 | <6 | 52 | SO Ad 13 |
| 50 | 10 | 6 | 34 | <10 | 120 | <6 | 42 | SO Ae 16 |
| 210 | <10 | 5 | 21 | <10 | 110 | <6 | 48 | SO Ae 17 |
| 3,400 | <10 | 15 | 130 | <10 | 140 | <6 | 5 | SO Ae 18 |
| 2,500 | 10 | 12 | 110 | <10 | 220 | <6 | 15 | SO Af 20 |
| 4,100 | <10 | 18 | 290 | <10 | 380 | <6 | 50 | SO Bb 15 |
| 370 | 20 | 35 | 3 | <10 | 180 | <6 | 7 | SO Bb 19 |
| 140 | 10 | 22 | 42 | <10 | 320 | <6 | 52 | SO Bc 15 |
| 1,700 | <10 | 12 | 46 | <10 | 71 | <6 | 160 | SO Bd 33 |
| 13,000 | <10 | 9 | 250 | <10 | 250 | <6 | 8 | SO Bd 37 |
| 130 | <10 | 12 | 5 | <10 | 110 | <6 | 100 | SO Bd 39 |
| -- | -- | 2,400 | 10 | -- | -- | -- | 280 | SO Be 14 |
| -- | -- | 600 | 2,000 | -- | -- | -- | 10 | SO Be 49 |
| 41 | <10 | 11 | 9 | <10 | 110 | <6 | 8 | SO Be 51 |
| 57 | <10 | 15 | 12 | <10 | 120 | <6 | 12 | SO Be 54 |
| 50 | <10 | 11 | 12 | <10 | 120 | <6 | 10 | SO Be 56 |
| 41 | <10 | 8 | 9 | <10 | 110 | <6 | 100 | SO Be 58 |
| 2,200 | <10 | 8 | 32 | <10 | 48 | <6 | 3 | SO Be 72 |
| 13,000 | 20 | 15 | 140 | <10 | 110 | <6 | 36 | SO Be 77 |
| 71 | 10 | 8 | 17 | <10 | 100 | <6 | 64 | SO Be 83 |
| 110 | 10 | 13 | 17 | <10 | 100 | <6 | <3 | SO Be 84 |
| 71 | <10 | 12 | 11 | 10 | 140 | <6 | 40 | SO Be 86 |
| 7,500 | <10 | 6 | 100 | <10 | 27 | <6 | 17 | SO Be 87 |
| 1,300 | <10 | 6 | 30 | <10 | 180 | <6 | 340 | SO Be 88 |
| 2,200 | 20 | <4 | 35 | <10 | 41 | <6 | 57 | SO Be 89 |
| 30 | <10 | 11 | 8 | <10 | 92 | <6 | <3 | SO Be 91 |
| 460 | <10 | 12 | 36 | <10 | 83 | <6 | 17 | SO Be 92 |
| 13 | <10 | 13 | 3 | <10 | 5 | <6 | <3 | SO Be 93 |
| 4,000 | <10 | 13 | 110 | <10 | 37 | <6 | 3,000 | SO Be 94 |
| 46 | <10 | 13 | 9 | <10 | 120 | <6 | 25 | SO Be 95 |
| 19 | 10 | 7 | 6 | <10 | 92 | <6 | 17 | SO Bf 14 |
| 87 | <10 | 9 | 9 | <10 | 90 | <6 | 25 | SO Bf 15 |
| 160 | 10 | 7 | 27 | <10 | 170 | <6 | <3 | SO Bf 17 |
| 89 | <10 | 7 | 17 | <10 | 110 | <6 | 6 | SO Bf 18 |
| 9 | 10 | <4 | 11 | <10 | 190 | <6 | 5 | SO Bf 20 |
| 56 | <10 | 23 | 34 | <10 | 350 | <6 | 7 | SO Cb 24 |
| 21 | <10 | 12 | 8 | 10 | 42 | <6 | <3 | SO Cc 6 |
| 870 | 40 | -- | -- | -- | -- | -- | -- | SO Cc 7 |
| 360 | 20 | -- | 20 | -- | -- | -- | -- | SO Cd 41 |
| 80 | <10 | -- | <10 | -- | -- | -- | -- | |
| 80 | <10 | <10 | 20 | -- | -- | -- | -- | |
| 10 | <10 | 11 | 8 | <10 | 36 | <6 | <3 | |
| 17,000 | <10 | 52 | 210 | <10 | 110 | <6 | 130 | SO Cd 44 |
| 11,000 | <10 | 5 | 540 | <10 | 55 | <6 | 11 | SO Cd 45 |
| 110 | <10 | 24 | 17 | <10 | 340 | <6 | 26 | SO Cd 49 |
| 3,200 | <10 | 22 | 310 | <10 | 500 | <6 | 110 | SO Cd 50 |
| 470 | <30 | 29 | 22 | <30 | 520 | <18 | 100 | SO Cd 51 |
| 41,000 | <10 | 19 | 900 | <10 | 61 | <6 | 79 | SO Cd 52 |
| 1,300 | <10 | 13 | 120 | <10 | 250 | <6 | 610 | SO Ce 53 |
| 200 | 30 | 29 | 15 | <30 | 690 | <18 | 57 | SO Ce 56 |
| 10 | <10 | 10 | 11 | <10 | 260 | <6 | 25 | SO Ce 64 |
| 140 | 10 | 14 | 10 | <10 | 360 | <6 | 32 | SO Ce 65 |

TABLE 13
CHEMICAL ANALYSES OF GROUND WATER IN SOMERSET COUNTY—Continued
[μS/cm = microsiemens per centimeter; deg C = degrees Celsius;
mg/L = milligrams per liter; < = less than; -- = no data]

| Well no. | Aquifer | Date | Specific conductance laboratory (μS/cm) | pH field (standard units) | Water temperature (deg C) | Hardness (mg/L as $CaCO_3$) | Oxygen, dissolved (mg/L) | Calcium, dissolved (mg/L as Ca) | Magnesium, dissolved (mg/L as Mg) |
|---|---|---|---|---|---|---|---|---|---|
| SO Ce 74 | 122MNKN | 08-13-86 | 1,870 | 7.8 | 16.0 | 110 | 0.4 | 19 | 14 |
| SO Ce 81 | 122PCMK | 09-03-86 | 754 | 6.5 | 15.0 | 180 | 0 | 53 | 11 |
| SO Ce 83 | 112PCPC | 08-12-86 | 387 | 5.8 | 21.5 | 45 | -- | 10 | 4.8 |
| SO Cf 16 | 122MNKN | 08-12-86 | 1,850 | 7.5 | 16.5 | 120 | 0 | 22 | 16 |
| SO Cf 20 | 112PCPC | 08-12-86 | 455 | 5.0 | 16.5 | 50 | -- | 11 | 5.5 |
| SO Dc 3 | 217PTMC | [1] 10-21-66 | 1,000 | 8.1 | 23.5 | 9 | -- | 2.6 | .60 |
| | | [2] 10-26-66 | 1,220 | 8.6 | 27.0 | 19 | -- | 6.9 | .40 |
| | | [1] 11-02-66 | 971 | 8.4 | 28.0 | 4 | -- | 1.0 | .30 |
| | | 12-21-70 | 982 | 8.5 | 27.5 | 4 | -- | .80 | .50 |
| SO Dc 4 | 217PTMC | 12-21-70 | 982 | 8.5 | 27.5 | 4 | -- | .80 | .50 |
| | | 09-09-86 | 988 | 8.5 | 28.0 | 3 | -- | .62 | .35 |
| SO Dc 5 | 122MOCN | 08-27-86 | 1,090 | 7.3 | 19.5 | 280 | 0 | 41 | 42 |
| SO Dc 6 | 112PCPC | 08-13-86 | 8,260 | 6.5 | 16.0 | 2,500 | 0 | 800 | 110 |
| SO Dd 29 | 122MOCN | 12-08-52 | 1,810 | 7.9 | -- | 260 | -- | 40 | 39 |
| SO Dd 48 | 122MOCN | 08-13-86 | 657 | 7.2 | 16.0 | 180 | .2 | 31 | 25 |
| SO Dd 51 | 122MOCN | 08-14-86 | 1,820 | 7.3 | 15.5 | 360 | 0 | 59 | 51 |
| SO Dd 58 | 122PCMK | 08-14-86 | 469 | 6.0 | 16.5 | 160 | 0 | 47 | 9.4 |
| SO Dd 59 | 122MOCN | 08-13-86 | 1,100 | 7.3 | 17.0 | 160 | .3 | 26 | 24 |
| SO Dd 60 | 122MOCN | 08-14-86 | 1,250 | 7.3 | 17.5 | 150 | 0 | 24 | 22 |
| SO De 29 | 122PCMK | 08-14-86 | 384 | 6.7 | 15.5 | 140 | 0 | 31 | 14 |
| SO De 31 | 122PCMK | 08-14-86 | 623 | 6.4 | 16.5 | 180 | 0 | 60 | 7.9 |
| SO De 33 | 122PCMK | 08-13-86 | 95 | 6.3 | 15.5 | 22 | 0 | 6.2 | 1.6 |
| SO De 36 | 122PCMK | 08-13-86 | 463 | 6.6 | 16.5 | 180 | 0 | 55 | 9.5 |
| SO Df 9 | 122MNKN | 08-12-86 | 2,220 | 7.6 | 18.0 | 140 | 0 | 23 | 19 |
| SO Df 13 | 122MNKN | 08-15-86 | 2,110 | 7.6 | 16.0 | 120 | 0 | 21 | 17 |
| SO Df 14 | 122PCMK | 08-15-86 | 447 | 5.1 | 18.0 | 140 | .6 | 22 | 20 |
| SO Df 16 | 122PCMK | 08-15-86 | 152 | 5.7 | 17.5 | 40 | 0 | 9.1 | 4.1 |
| SO Df 20 | 122PCMK | 08-13-86 | 743 | 7.2 | 16.0 | 190 | 0 | 40 | 22 |
| SO Df 21 | 122PCMK | 08-13-86 | 762 | 7.2 | 15.5 | 200 | .3 | 38 | 26 |
| SO Df 26 | 122PCMK | 08-15-86 | 180 | 4.7 | 16.0 | 24 | 0 | 2.8 | 4.1 |
| SO Df 27 | 122PCMK | 09-04-86 | 263 | 6.4 | 15.0 | 100 | 0 | 37 | 2.4 |
| SO Dg 5 | 122MNKN | 08-12-86 | 2,060 | 7.4 | 18.0 | 120 | 0 | 22 | 16 |
| SO Dg 7 | 122PCMK | 08-12-86 | 156 | 6.0 | 18.0 | 48 | 0 | 12 | 4.4 |
| SO Ea 1 | 217PTMC | 04-26-48 | -- | 8.4 | -- | 8 | -- | 2.0 | .80 |
| SO Ea 3 | 217PTMC | 05-06-87 | 1,480 | 8.6 | 20.5 | 39 | -- | 7.3 | 5.1 |
| SO Ea 4 | 217PTMC | 04-26-48 | -- | -- | -- | 9 | -- | -- | -- |
| | | 05-06-87 | 826 | 8.4 | 24.0 | 5 | -- | 1.5 | .40 |
| SO Ea 5 | 217PTMC | 04-12-48 | -- | 8.5 | 24.0 | 7 | -- | 1.8 | .70 |
| SO Ea 7 | 217PTMC | 05-06-87 | 962 | 8.1 | 24.0 | 6 | -- | 1.5 | .60 |
| SO Ea 11 | 217PTMC | 02-06-70 | 767 | 8.6 | -- | 3 | -- | .80 | .30 |
| SO Ec 1 | 125PLCN | 10-19-51 | 1,720 | 8.5 | 22.8 | 8 | -- | 1.8 | .90 |
| | | 10-19-66 | 1,740 | 7.9 | -- | 11 | -- | 2.4 | 1.1 |
| | | 09-09-86 | 1,750 | 8.5 | 26.5 | 10 | -- | 1.9 | 1.2 |
| SO Ec 3 | 217PTMC | 10-19-51 | 1,160 | 8.5 | 26.0 | 6 | -- | .50 | 1.2 |
| | | 09-09-86 | 1,120 | 8.4 | 26.5 | 3 | -- | .71 | .40 |
| SO Ec 4 | 124PNPN<br>125PLCN<br>217PTMC | 10-19-51 | 1,170 | 8.5 | 27.0 | 5 | -- | .50 | .90 |
| SO Ec 33 | 122CPNK | 12-08-52 | 5,780 | 7.6 | -- | 210 | -- | 31 | 31 |
| SO Ec 48 | 217PTMC | 09-09-86 | 1,130 | 8.6 | 27.5 | 3 | .3 | .62 | .36 |
| SO Ec 49 | 125PLCN<br>217PTMC | 09-09-86 | 1,240 | 8.7 | 28.5 | 4 | -- | .80 | .50 |
| SO Ed 42 | 122MNKN | 08-27-86 | 2,510 | 7.0 | 18.0 | 210 | .4 | 34 | 29 |
| SO Ed 43 | 122MNKN | 08-27-86 | 1,570 | 7.1 | 20.0 | 250 | .6 | 45 | 33 |
| SO Ed 45 | 122MNKN | 08-27-86 | 1,490 | 7.4 | 19.0 | 76 | 0 | 14 | 10 |
| SO Ef 6 | 122PCMK | 08-29-86 | 1,800 | 7.3 | 17.0 | 410 | 0 | 91 | 45 |

| Sodium, dis- solved (mg/L as Na) | Potas- sium, dis- solved (mg/L as K) | Alka- linity, carbonate field (mg/L as $CaCO_3$) | Sulfate, dis- solved (mg/L as $SO_4$) | Chlo- ride, dis- solved (mg/L as Cl) | Fluo- ride, dis- solved (mg/L as F) | Silica, dis- solved (mg/L as $SiO_2$) | Solids, at 180 deg C dis- solved (mg/L) | Nitrogen, ammonia dis- solved (mg/L as N) | Well no. |
|---|---|---|---|---|---|---|---|---|---|
| 350 | 15 | 415 | 86 | 320 | 0.20 | 9.3 | 1,070 | 1.00 | SO Ce 74 |
| 80 | 7.1 | 200 | 63 | 110 | .30 | 51 | 444 | 1.00 | SO Ce 81 |
| 19 | 1.7 | 56 | 72 | 31 | < .10 | 24 | 224 | .160 | SO Ca 83 |
| 370 | 15 | 420 | 86 | 310 | .20 | 11 | 1,060 | .910 | SO Cf 16 |
| 34 | 1.6 | 12 | 82 | 54 | < .10 | 42 | 252 | .690 | SO Cf 20 |
| 250 | 6.7 | 439 | 44 | 55 | 1.8 | 12 | 649 | -- | SO Dc 3 |
| 240 | 65 | 427 | 56 | 110 | 1.6 | 14 | 749 | -- | |
| 250 | 6.4 | 447 | 43 | 42 | 1.2 | 13 | 620 | -- | |
| 240 | 5.0 | 437 | 43 | 41 | 2.1 | 12 | 624 | -- | |
| 240 | 5.0 | 437 | 43 | 41 | 2.1 | 12 | 624 | -- | SO Dc 4 |
| 230 | 4.7 | 440 | 47 | 41 | 2.0 | 12 | 610 | .120 | |
| 120 | 22 | 340 | 84 | 120 | .70 | 12 | 590 | 1.00 | SO Dc 5 |
| 870 | 13 | 220 | 300 | 2,800 | .20 | 59 | 5,720 | 3.00 | SO Dc 6 |
| 273 | 26 | 385 | 162 | 278 | .20 | 15 | 1,080 | -- | SO Dd 29 |
| 65 | 17 | 295 | 2.6 | 57 | < .10 | 15 | 381 | 1.10 | SO Dd 48 |
| 240 | 27 | 395 | 200 | 270 | .10 | 12 | 1,100 | 1.80 | SO Dd 51 |
| 31 | 5.5 | 165 | 49 | 40 | .20 | 61 | 358 | 1.10 | SO Dd 58 |
| 180 | 20 | 350 | 12 | 180 | .10 | 13 | 642 | 1.10 | SO Dd 59 |
| 210 | 18 | -- | 26 | 210 | .20 | 13 | 745 | 1.10 | SO Dd 60 |
| 26 | 8.9 | 186 | 2.9 | 17 | .10 | 41 | 253 | .510 | SO De 29 |
| 55 | 5.3 | 185 | 35 | 80 | .20 | 56 | 422 | 1.20 | SO De 31 |
| 8.2 | 1.2 | 36 | 12 | 11 | .10 | 53 | 116 | .500 | SO De 33 |
| 27 | 5.3 | 162 | 26 | 36 | .20 | 41 | 309 | .330 | SO De 36 |
| 410 | 18 | 395 | 89 | 450 | .20 | 10 | 1,260 | 1.10 | SO Df 9 |
| 400 | 17 | 380 | 91 | 420 | .20 | 9.6 | 1,200 | 1.10 | SO Df 13 |
| 13 | 25 | 15 | 120 | 35 | < .10 | 13 | 281 | .040 | SO Df 14 |
| 13 | 2.5 | 68 | 18 | 15 | .20 | 37 | 136 | .370 | SO Df 16 |
| 85 | 10 | 240 | 19 | 95 | .20 | 34 | 456 | .490 | SO Df 20 |
| 89 | 16 | 310 | 19 | 71 | .10 | 32 | 464 | .580 | SO Df 21 |
| 9.9 | 2.0 | 5.0 | 30 | 17 | < .10 | 19 | 97 | .030 | SO Df 26 |
| 12 | 1.2 | 133 | 2.4 | 13 | .30 | 29 | 177 | .210 | SO Df 27 |
| 380 | 16 | 385 | 79 | 410 | .20 | 12 | 1,170 | .930 | SO Dg 5 |
| 12 | 2.6 | 76 | 22 | 9.4 | .40 | 36 | 132 | .230 | SO Dg 7 |
| 241 | -- | 445 | 32 | 10 | 3.0 | 11 | 588 | -- | SO Ea 1 |
| 300 | 8.4 | -- | 47 | 170 | 2.2 | 13 | 809 | .040 | SO Ea 3 |
| -- | -- | -- | 35 | 8.0 | 4.4 | -- | -- | -- | SO Ea 4 |
| 190 | 4.1 | -- | 28 | 6.0 | 1.8 | 13 | 475 | .050 | |
| -- | -- | 400 | 30 | 10 | 2.8 | 11 | 522 | -- | SO Ea 5 |
| 220 | 5.5 | -- | 33 | 12 | 2.8 | 12 | 551 | .040 | SO Ea 7 |
| 180 | 4.0 | 352 | 39 | 11 | 2.0 | 13 | 473 | -- | SO Ea 11 |
| 440 | 8.0 | 763 | 65 | 100 | 5.6 | 13 | 1,090 | -- | SO Ec 1 |
| 420 | 8.0 | 711 | 58 | 120 | 4.6 | 11 | 1,080 | -- | |
| 400 | 8.9 | 710 | 62 | 130 | 4.4 | 11 | 1,070 | .550 | |
| 290 | 3.0 | 490 | 51 | 70 | 2.2 | 14 | 732 | -- | SO Ec 3 |
| 260 | 5.3 | 470 | 53 | 66 | 2.2 | 12 | 680 | .500 | |
| 290 | 4.4 | 487 | 56 | 72 | 1.8 | 14 | 730 | -- | SO Ec 4 |
| 1,300 | 45 | 984 | 62 | 1,400 | .70 | 58 | 3,440 | -- | SO Ec 33 |
| 260 | 5.0 | 450 | 51 | 72 | 2.1 | 12 | 708 | .090 | SO Ec 48 |
| 280 | 5.2 | 465 | 56 | 110 | 2.0 | 12 | 733 | .170 | SO Ec 49 |
| 440 | 25 | 475 | 53 | 530 | .20 | 29 | 1,840 | 1.50 | SO Ed 42 |
| 200 | 24 | 380 | 55 | 240 | .20 | 19 | 1,180 | 1.30 | SO Ed 43 |
| 280 | 16 | 440 | 28 | 220 | .30 | 23 | 853 | .990 | SO Ed 45 |
| 190 | 22 | 305 | 48 | 380 | .20 | 33 | 1,440 | 1.00 | SO Ef 6 |

TABLE 13

CHEMICAL ANALYSES OF GROUND WATER IN SOMERSET COUNTY—Continued

[deg C = degrees Celsius; mg/L = milligrams per liter; µg/L = micrograms per liter; < = less than; -- = no data]

| Well no. | Nitrogen, ammonia plus organic dissolved (mg/L as N) | Nitrogen, $NO_2$ + $NO_3$ dissolved (mg/L as N | Phos-phorus, dis-solved (mg/L as P) | Barium, dis-solved (µg/L as Ba) | Beryl-lium, dis-solved (µg/L as Be) | Boron, dis-solved (µg/L as B | Cadmium, dis-solved (µg/L as Cd) | Cobalt, dis-solved (µg/L as Co) | Copper, dis-solved (µg/L as Cu) |
|---|---|---|---|---|---|---|---|---|---|
| SO Ce 74 | 1.2 | <0.100 | 0.170 | 22 | <0.5 | 1,200 | 5 | <3 | <10 |
| SO Ce 81 | 1.5 | < .100 | .180 | 37 | < .5 | 140 | <1 | <3 | <10 |
| SO Ce 83 | .30 | < .100 | < .010 | 43 | < .5 | 30 | 4 | <3 | <10 |
| SO Cf 16 | 1.1 | < .100 | .220 | 18 | < .5 | 1,100 | 4 | <3 | <10 |
| SO Cf 20 | .90 | < .100 | .010 | 56 | < .5 | 20 | 3 | <3 | <10 |
| SO Dc 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Dc 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | .30 | < .100 | .400 | 30 | < .5 | 1,300 | <1 | <3 | <10 |
| SO Dc 5 | 1.0 | < .100 | < .100 | 30 | .7 | 560 | 4 | <3 | <10 |
| SO Dc 6 | 2.8 | < .100 | .100 | 370 | < .5 | 80 | <10 | <3 | <10 |
| SO Dd 29 | -- | -- | -- | -- | -- | -- | -- | -- | 30 |
| SO Dd 48 | 1.4 | < .100 | .100 | 21 | < .5 | 500 | 1 | <3 | <10 |
| SO Dd 51 | 1.8 | < .100 | .090 | 38 | < .5 | 1,000 | <1 | <3 | <10 |
| SO Dd 58 | 1.2 | < .100 | .060 | 27 | < .5 | 70 | 2 | <3 | <10 |
| SO Dd 59 | 1.3 | < .100 | .160 | 24 | < .5 | 800 | <1 | <3 | <10 |
| SO Dd 60 | 1.4 | < .100 | .140 | 30 | < .5 | 940 | 2 | <3 | <10 |
| SO De 29 | .80 | < .100 | .550 | 27 | < .5 | 100 | <1 | <3 | <10 |
| SO De 31 | 1.4 | < .100 | .110 | 38 | < .5 | 100 | 1 | <3 | <10 |
| SO De 33 | .50 | < .100 | .010 | 13 | < .5 | 20 | <1 | <3 | <10 |
| SO De 36 | .60 | .700 | .110 | 58 | < .5 | 70 | <1 | <3 | <10 |
| SO Df 9 | 1.4 | < .100 | .130 | 21 | < .5 | 1,300 | <1 | <3 | <10 |
| SO Df 13 | 1.4 | < .100 | .160 | 20 | < .5 | 1,400 | <1 | <3 | <10 |
| SO Df 14 | .50 | 6.50 | < .010 | 39 | < .5 | 10 | 2 | 30 | <10 |
| SO Df 16 | .40 | < .100 | .160 | 20 | < .5 | 20 | 1 | <3 | <10 |
| SO Df 20 | .60 | < .100 | .370 | 19 | < .5 | 190 | <1 | <3 | <10 |
| SO Df 21 | .80 | < .100 | .310 | 21 | < .5 | 260 | <1 | <3 | <10 |
| SO Df 26 | < .20 | < .100 | < .010 | 54 | < .5 | 20 | 1 | <3 | <10 |
| SO Df 27 | .20 | < .100 | .190 | 33 | .5 | 10 | <1 | <3 | <10 |
| SO Dg 5 | 1.1 | < .100 | .100 | 19 | < .5 | 1,300 | 6 | <3 | <10 |
| SO Dg 7 | .40 | < .100 | .420 | 16 | < .5 | 30 | <1 | <3 | <10 |
| SO Ea 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Ea 3 | .90 | < .100 | .230 | 12 | < .5 | 760 | <1 | <3 | <10 |
| SO Ea 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | .40 | < .100 | .290 | 20 | < .5 | 670 | <1 | <3 | <10 |
| SO Ea 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Ea 7 | .60 | < .100 | .190 | 20 | < .5 | 930 | <1 | <3 | <10 |
| SO Ea 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Ec 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | .80 | < .100 | .310 | 65 | < .5 | 3,200 | <1 | <3 | <10 |
| SO Ec 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | .60 | < .100 | .350 | 31 | < .5 | 1,400 | 1 | <3 | <10 |
| SO Ec 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Ec 33 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SO Ec 48 | .20 | < .100 | .350 | 29 | < .5 | 1,400 | <1 | <3 | <10 |
| SO Ec 49 | .30 | < .100 | .360 | 66 | < .5 | 1,600 | <1 | <3 | <10 |
| SO Ed 42 | 1.7 | < .100 | .070 | 14 | <2 | 1,500 | <1 | <9 | <30 |
| SO Ed 43 | 1.9 | < .100 | .070 | 21 | < .5 | 960 | <1 | <3 | <10 |
| SO Ed 45 | 1.5 | < .100 | .130 | 16 | 2 | 1,300 | 6 | 3 | <10 |
| SO Ef 6 | .90 | < .100 | .140 | 31 | < .5 | 310 | <1 | <3 | <10 |

1/ sampled interval 1,128 - 1,138 ft

2/ sampled interval 1,272 - 1,287 ft

| Iron, dis- solvsd (µg/L as Fe) | Lead, dis- solvsd (µg/L as Pb) | Lithium, dis- solved (µg/L as Li) | Manga- ness, dis- solved (µg/L as Mn) | Molyb- denum, dis- solvsd (µg/L as Mo) | Stron- tium, dis- solved (µg/L as Sr) | Vana- dium, dis- solvsd (µg/L as V) | Zinc, dis- solvsd (µg/L as Zn) | Well no. |
|---|---|---|---|---|---|---|---|---|
| 110 | <10 | 13 | 7 | <10 | 330 | <6 | 100 | SO Ce 74 |
| 9,700 | <10 | 34 | 180 | <10 | 330 | <6 | <3 | SO Ce 81 |
| 48,000 | <10 | 13 | 180 | <10 | 90 | 8 | 2,800 | SO Ce 83 |
| 140 | <10 | 11 | 5 | <10 | 370 | <6 | 210 | SO Cf 16 |
| 27,000 | <10 | 29 | 160 | <10 | 96 | <6 | 41 | SO Cf 20 |
| 420 | -- | -- | 40 | -- | -- | -- | -- | SO Dc 3 |
| 150 | -- | -- | 10 | -- | -- | -- | -- | |
| 190 | -- | -- | <5 | -- | -- | -- | -- | |
| 360 | -- | -- | 10 | -- | -- | -- | -- | |
| 360 | -- | -- | 10 | -- | -- | -- | -- | SO Dc 4 |
| 20 | 10 | 11 | 7 | 10 | 22 | <6 | <3 | |
| 300 | <10 | 17 | 9 | <10 | 500 | <6 | 34 | SO Dc 5 |
| 55,000 | 70 | 200 | 1,300 | <10 | 4,500 | 8 | 120 | SO Dc 6 |
| 110 | -- | 5,000 | 10 | -- | -- | -- | -- | SO Dd 29 |
| 550 | <10 | 15 | 11 | <10 | 360 | <6 | 190 | SO Dd 48 |
| 500 | <10 | 29 | 18 | <10 | 810 | <6 | 91 | SO Dd 51 |
| 16,000 | <10 | 38 | 300 | <10 | 290 | <6 | 12 | SO Dd 58 |
| 180 | <10 | 19 | 10 | <10 | 320 | <6 | 76 | SO Dd 59 |
| 220 | <10 | 21 | 13 | <10 | 340 | <6 | 14 | SO Dd 60 |
| 2,400 | <10 | 12 | 49 | <10 | 240 | <6 | 140 | SO De 29 |
| 4,400 | <10 | 38 | 120 | <10 | 360 | <6 | 22 | SO De 31 |
| 5,500 | <10 | 12 | 55 | <10 | 31 | <6 | 13 | SO De 33 |
| 380 | <10 | 17 | 83 | <10 | 320 | <6 | 7 | SO De 36 |
| 170 | <10 | 13 | 17 | <10 | 410 | <6 | 79 | SO Df 9 |
| 130 | <10 | 12 | 6 | <10 | 400 | <6 | 58 | SO Df 13 |
| 73 | <10 | 5 | 640 | <10 | 350 | <6 | 120 | SO Df 14 |
| 13,000 | <10 | 10 | 250 | <10 | 69 | <6 | 12 | SO Df 16 |
| 1,000 | <10 | 18 | 96 | <10 | 350 | <6 | 10 | SO Df 20 |
| 690 | <10 | 19 | 12 | <10 | 360 | <6 | 17 | SO Df 21 |
| 7,500 | <10 | 7 | 100 | <10 | 47 | <6 | 54 | SO Df 26 |
| 13,000 | <10 | 15 | 270 | <10 | 250 | <6 | 14 | SO Df 27 |
| 150 | <10 | 11 | 5 | <10 | 380 | <6 | 210 | SO Dg 5 |
| 9,500 | <10 | 10 | 250 | <10 | 90 | <6 | 120 | SO Dg 7 |
| 20 | -- | -- | -- | -- | -- | -- | -- | SO Ea 1 |
| 14 | 20 | 9 | 31 | <10 | 180 | <6 | 23 | SO Ea 3 |
| -- | -- | -- | -- | -- | -- | -- | -- | SO Ea 4 |
| 8 | 10 | 5 | 13 | <10 | 33 | <6 | 19 | |
| 20 | -- | -- | -- | -- | -- | -- | -- | SO Ea 5 |
| 14 | <10 | 6 | 8 | <10 | 43 | <6 | <3 | SO Ea 7 |
| -- | -- | -- | -- | -- | -- | -- | -- | SO Ea 11 |
| 1,800 | -- | -- | -- | -- | -- | -- | -- | SO Ec 1 |
| 80 | -- | 10 | -- | -- | -- | -- | -- | |
| 24 | <10 | 21 | 4 | 20 | 65 | <6 | 4 | |
| 120 | -- | -- | -- | -- | -- | -- | -- | SO Ec 3 |
| 26 | <10 | 12 | 7 | <10 | 29 | <6 | 5 | |
| 100 | -- | -- | -- | -- | -- | -- | -- | SO Ec 4 |
| 170 | -- | -- | -- | -- | -- | -- | -- | SO Ec 33 |
| 15 | <10 | 14 | 6 | 10 | 25 | <6 | 6 | SO Ec 48 |
| 22 | <10 | 12 | 9 | 10 | 36 | <6 | <3 | SO Ec 49 |
| 90 | <30 | 45 | <3 | <30 | 600 | <18 | 22 | SO EC 42 |
| 210 | <10 | 32 | 7 | <10 | 540 | <6 | 13 | SO Ed 43 |
| 78 | <10 | 31 | 8 | <10 | 240 | <6 | 14 | SO Ed 45 |
| 980 | <10 | 44 | 52 | <10 | 920 | <6 | 29 | SO Ef 6 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—explanation of codes

| Aquifer codes | | Water-use codes | |
|---|---|---|---|
| 112PCPC | Surficial aquifer system | C | Commercial |
| 122MOCN | Miocene series | H | Domestic |
| 122PCMK | Pocomoke aquifer | I | Irrigation |
| 122MNKN | Manokin aquifer | N | Industrial |
| 122CPNK | Choptank aquifer | P | Public supply |
| 124PNPN | Piney Point aquifer | S | Stock |
| 125PLCN | Paleocene aquifer system | U | Unused |
| 217PTMC | Potomac aquifer system | Z | Other |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; f = flowing well; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers; USGS = U.S. Geological Survey; MD. WRA = Maryland Water Resources Administration]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Ad 1 | -- | LYON, W D | MUIR | 00-00-44 | 10 | 40 | 1.5 |
| SO Ad 2 | -- | LONG, THOMAS J | -- | 00-00-32 | 10 | 16 | 36 |
| SO Ad 3 | -- | PINKETT, BRISCOE, JR | WHITE | 00-00-51 | 10 | 106 | 1.5 |
| SO Ad 4 | -- | BLOODSWORTH, FLOYD | WHITE | 00-00-49 | 10 | 53 | 1.5 |
| SO Ad 5 | -- | LARIMER, SUSY M | MUIR | 00-00-51 | 10 | 26 | 1.5 |
| SO Ad 6 | -- | BOUNDS, CLAUD | -- | 00-00-42 | 5 | 14 | 1.5 |
| SO Ad 7 | -- | MCGRATH, HAROLD | WHITE | 00-00-20 | 10 | 114 | 2 |
| SO Ad 8 | -- | STREET, R B | -- | 00-00-10 | 5 | 20 | 1.75 |
| SO Ad 9 | -- | REDDEN, J ELMER | WHITE | 00-00-45 | 15 | 130 | 2 |
| SO Ad 11 | SO-73-1240 | SOMERSET CO. BOARD OF ED | WALLACE | 07-25-78 | 10 | 130 | 4 |
| SO Ad 12 | SO-73-1735 | WHITE, TOM | KAUFFMAN | 07-17-80 | 10 | 66 | 4 |
| SO Ad 13 | SO-81-0467 | PETERS, ARBY | SWD | 07-30-84 | 10 | 150 | 2 |
| SO Ad 14 | -- | FISHER, CHARLES | -- | -- | 3 | 49 | 2 |
| SO Ad 15 | SO-81-0707 | WILES, THOMAS | SWD | 08-26-85 | 13 | 150 | 2 |
| SO Ae 1 | SO-00-5877 | CLARK, M K | WHITE | 05-00-50 | 10 | 123 | 2 |
| SO Ae 2 | -- | GALE, C | -- | 00-00-37 | 5 | 20 | 1.5 |
| SO Ae 3 | -- | STURGIS, CURTIS | -- | 00-00-47 | 20 | 30 | 1.5 |
| SO Ae 4 | -- | BENEPEE, ROBERT | WHITE | 00-00-37 | 5 | 130 | 2 |
| SO Ae 5 | -- | BENEPEE, ROBERT | WHITE | 00-00-37 | 5 | 90 | 2 |
| SO Ae 6 | -- | BELL, ALDA | -- | 00-00-46 | 10 | 25 | 1.25 |
| SO Ae 7 | -- | GRIFFIN, H L | -- | -- | 15 | 30 | 1.25 |
| SO Ae 8 | -- | JONES, LESTER | WHITE | 00-00-48 | 15 | 147 | 1.5 |
| SO Ae 9 | -- | CROSWELL, VIRGINIA | -- | 00-00-77 | 20 | 25 | 1.5 |
| SO Ae 10 | -- | MUIR, EDNA D | -- | 00-00-02 | 20 | 35 | 1.5 |
| SO Ae 11 | -- | SMITH, NORMA | -- | 05-00-51 | 20 | 50 | 1.5 |
| SO Ae 12 | -- | INGERSOL, WALTER | -- | 00-00-21 | 10 | 27 | 1.5 |
| SO Ae 13 | -- | BARKLEY, MARTIN | -- | 00-00-21 | 20 | 27 | 1.5 |
| SO Ae 14 | SO-00-9644 | HITCH, THORNTON | WHITE | 04-00-52 | 20 | 121 | 2 |
| SO Ae 15 | SO-81-0088 | ADKINS, EPHRAIM | SWD | 07-01-82 | 10 | 50 | 4 |
| SO Ae 16 | -- | ADKINS, JEFF | -- | -- | 20 | 65 | 4 |
| SO Ae 17 | SO-81-0266 | WHITE, MILLER | SWD | 08-00-83 | 10 | 35 | 2 |
| SO Ae 18 | -- | SPENCE, HUGH | -- | 00-00-78 | 25 | 160 | 2 |
| SO Ae 19 | SO-81-1000 | U.S. GEOLOGICAL SURVEY | USGS | 12-11-86 | 20 | 14 | 2 |
| SO Ae 20 | -- | U.S. GEOLOGICAL SURVEY | MD. WRA | 03-11-87 | 20 | 140 | 2 |
| SO Ae 21 | SO-81-0611 | POTTS, TERRY | LARSON WELLS | 05-22-85 | 20 | 360 | 2 |
| SO Af 1 | -- | TAYLOR, S IRVING | TAYLOR | 00-00-50 | 30 | -- | 1.25 |
| SO Af 2 | -- | CHRISTOPHER, E | OWNER | 00-00-51 | 40 | 34 | 1.25 |
| SO Af 3 | -- | WHITE, M | SHOCKLEY | -- | 45 | 37 | 1.25 |
| SO Af 4 | -- | POLLITT, L E | -- | 00-00-49 | 40 | 32 | 1.5 |
| SO Af 5 | -- | HARMON, PIERCE | SHOCKLEY | 00-00-43 | 40 | -- | 1.5 |
| SO Af 6 | -- | POLLITT, ELMER | CAMPBELL | 00-00-41 | 45 | 24.0 | 1.5 |
| SO Af 7 | -- | WILLEY, J E | CAMPBELL | 00-00-47 | 35 | 32 | 1.5 |
| SO Af 8 | -- | ARMSTRONG, EDDIE | -- | 00-00-47 | 40 | 30 | 1.5 |
| SO Af 9 | -- | MERCER, S A | -- | 00-00-51 | 30 | 30 | 1.5 |
| SO Af 10 | -- | WILLEY, HERBERT | MURRAY | 02-00-52 | 25 | 35.0 | 1.5 |
| SO Af 11 | -- | BARKLEY, A C | -- | 00-00-20 | 25 | 33 | 1.5 |
| SO Af 12 | -- | JONES, MELVIN | -- | 00-00-44 | 40 | 16 | 1.5 |
| SO Af 13 | -- | JONES, OSCAR | -- | 00-00-24 | 45 | 32 | 1.5 |
| SO Af 14 | -- | PRYOR, DAVID | -- | 00-00-50 | 30 | 35 | 1.75 |
| SO Af 15 | -- | SNELLING, PEARL | CAMPBELL | 00-00-47 | 30 | 33 | 1.5 |
| SO Af 16 | -- | U.S. GEOLOGICAL SURVEY | HARDIN ASSOC | 11-17-80 | 30 | 90 | 2 |
| SO Af 17 | -- | U.S. GEOLOGICAL SURVEY | HARDIN ASSOC | 11-17-80 | 30 | 78 | 2 |
| SO Af 18 | SO-81-0129 | CHESAPEAKE LUMBER CO | DASHIELL DRLNG | 08-17-82 | 30 | 70 | 4 |
| SO Af 19 | SO-73-0899 | TUCKER, HOWARD | IWD | 05-23-77 | 30 | 50 | 4 |
| SO Af 20 | SO-81-0091 | EDEN MARKET | LARSON DRLNG | 06-23-82 | 30 | 180 | 2 |
| SO Af 21 | SO-81-0520 | EASTERN SHORE OIL | LARSON WELLS | 10-29-84 | 30 | 190 | 2 |
| SO Af 22 | SO-73-0586 | EDEN MOBILE HOME VILLAGE | IWD | 04-16-76 | 30 | 195 | 4 |
| SO Af 23 | SO-71-0069 | EDEN MOBILE HOME VILLAGE | IWD | 05-25-71 | 30 | 45 | 4 |
| SO Af 24 | SO-81-0302 | EDEN MOBILE HOME VILLAGE | DASHIELL DRLNG | 08-17-83 | 30 | 255 | 4 |
| SO Af 25 | SO-81-0324 | EDEN MOBILE HOME VILLAGE | DASHIELL DRLNG | 09-07-83 | 30 | 255 | 4 |

| Bottom of caeing or cesed inter-val (ft) | Diam-eter of screen (in.) | Bottom of ecraen or screened inter-val (ft) | Aquifer code | Water level (ft) | Dete weter level mees-urad | Drew-down (ft) | Die-cherge (gel/min) | Pumping period (hours) | Spe-cific cepe-city [(gel/min)/ft] | Uee of weter | Locel well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ad 1 |
| 16 | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ad 2 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Ad 3 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ad 4 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ad 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ad 6 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H,S | SO Ad 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ad 8 |
| 130 | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H,S | SO Ad 9 |
| 105 | 4 | 125 | 122MNKN | 8 | 07-25-78 | 4 | 60 | 2 | 15.0 | T | SO Ad 11 |
| 36 | 4 | 66 | 112PCPC | 8 | 07-17-80 | 8 | 60 | 1.5 | 7.5 | I | SO Ad 12 |
| 130 | 2 | 150 | 122MNKN | 11 | 07-30-84 | 7 | 17 | 1 | 2.4 | H | SO Ad 13 |
| -- | 2 | -- | 112PCPC | .4m | 04-14-87 | -- | -- | -- | -- | U | SO Ad 14 |
| 130 | 2 | 150 | 122MNKN | 14 | 08-26-85 | 1 | 50 | 1 | 50.0 | H | SO Ad 15 |
| 115 | 2 | 123 | 122MNKN | 3 | 05-00-50 | -- | 12 | 4 | -- | H,S | SO Ae 1 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ae 2 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ae 3 |
| -- | -- | -- | 122MNKN | +10f | 02-18-52 | -- | -- | -- | -- | U | SO Ae 4 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | U | SO Ae 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ae 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ae 7 |
| 137 | -- | 147 | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Ae 8 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ae 9 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ae 10 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ae 11 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ae 12 |
| -- | -- | -- | 112PCPC | 3 | 00-00-52 | -- | -- | -- | -- | H | SO Ae 13 |
| 113 | 2 | 121 | 122MNKN | 1 | 04-00-52 | -- | -- | -- | -- | H | SO Ae 14 |
| 27 | 4 | 50 | 122PCMK | 15 | 07-01-82 | 5 | 60 | 2 | 12.0 | I | SO Ae 15 |
| -- | -- | -- | 122PCMK | 11.7m | 04-14-87 | -- | -- | -- | -- | U | SO Ae 16 |
| 25 | 2 | 35 | 112PCPC | 12 | 08-00-83 | 3 | 10 | 1 | 3.3 | I | SO Ae 17 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Ae 18 |
| 9 | 2 | 14 | 112PCPC | 10.2m | 04-14-87 | -- | -- | -- | -- | U | SO Ae 19 |
| 130 | 2 | 140 | 122MNKN | 8.3m | 04-17-87 | -- | -- | -- | -- | U | SO Ae 20 |
| 340 | 2 | 360 | 122CPNK | 7 | 05-22-85 | 20 | 20 | 3 | 1.0 | H | SO Ae 21 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Af 1 |
| 34 | -- | -- | 112PCPC | 8.7m | 02-06-52 | -- | -- | -- | -- | H,S | SO Af 2 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 3 |
| -- | -- | -- | 112PCPC | 2 | 00-00-49 | -- | -- | -- | -- | H,S | SO Af 4 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 5 |
| -- | -- | -- | 112PCPC | 3.5m | 02-04-54 | -- | -- | -- | -- | H,S | SO Af 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Af 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 8 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,C | SO Af 9 |
| -- | -- | -- | 112PCPC | 5 | 02-00-52 | -- | -- | -- | -- | H,S | SO Af 10 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Af 11 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 12 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 13 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Af 14 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,C | SO Af 15 |
| 36.5 | 2 | 16.5- 26.5 | 122PCPC | 3.4m | 06-10-81 | -- | -- | -- | -- | U | SO Af 16 |
| 38 | 2 | 18 - 28 | 112PCPC | 5.9m<br>5.2m | 06-10-81<br>04-14-87 | -- | -- | -- | -- | U | SO Af 17 |
| 60 | 4 | 70 | 122PCMK | 8 | 08-17-82 | 5 | 100 | 1 | 20.0 | C | SO Af 18 |
| 40 | 4 | 50 | 112PCPC | 4 | 05-23-77 | 16 | 80 | 1 | 5.0 | S,Z | SO Af 19 |
| 170 | 2 | 180 | 122MNKN | 15 | 06-23-82 | 3 | 50 | 3 | 16.7 | C | SO Af 20 |
| 180 | 2 | 190 | 122MNKN | 17 | 10-29-84 | 3 | 45 | 1 | 15.0 | C | SO Af 21 |
| 185 | 4 | 195 | 122MNKN | 7 | 04-16-76 | 18 | 100 | 1 | 5.66 | P | SO Af 22 |
| 35 | 4 | 45 | 112PCPC | 5 | 05-25-71 | 20 | 70 | 3 | 3.5 | P | SO Af 23 |
| 235 | 4 | 255 | 122MNKN | 14 | 08-17-83 | 6 | 35 | 1 | 5.8 | P | SO Af 24 |
| 235 | 4 | 255 | 122MNKN | 14 | 09-07-83 | 7 | 60 | 1 | 8.6 | P | SO Af 25 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; f = flowing well; SWD = Somerset Well Drilling]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Bb 1 | SO-00-1591 | SOMERSET SEAFOOD CO | CUSICK | 09-13-47 | 5 | 814 | 2.5<br>1.5<br>-- |
| SO Bb 2 | SO-00-0903 | PRICE, THOMAS | TODD | 10-17-46 | 5 | 144 | 1.5 |
| SO Bb 3 | SO-00-0382 | WHITE, HAROLD | WHITE | 05-15-46 | 5 | 122 | 2 |
| SO Bb 4 | SO-00-0904 | BEECHAM, J T | TODD | 10-20-46 | 5 | 140 | 1.5 |
| SO Bb 5 | -- | CORBIN, G M | -- | -- | 10 | 145 | 3 |
| SO Bb 6 | -- | PARKS, W S | -- | 00-00-42 | 5 | 10 | 1.25 |
| SO Bb 7 | -- | JONES, ELDRIDGE | -- | 00-00-42 | 5 | 9 | 1.25 |
| SO Bb 8 | -- | BROWN, CLARENCE | -- | 00-00-44 | 10 | 12 | 1.5 |
| SO Bb 9 | SO-73-0603 | UNITED METHODIST CHURCH | DASHIELL DRLNG | 11-06-75 | 10 | 140 | 2 |
| SO Bb 10 | SO-81-0024 | PHILLIPS 66-EAST SHORE OIL | LARSON DRLNG | 12-01-81 | 10 | 115 | 2 |
| SO Bb 11 | SO-73-0802 | ROCK CREEK METHODIST CH | FORD | 09-10-76 | 10 | 135 | 2 |
| SO Bb 12 | SO-73-1088 | TAYLOR, ALBERT | HALL | 10-28-77 | 10 | 15 | -- |
| SO Bb 13 | SO-67-0020 | WILLING, ELDON, SR | MARSHALL | 08-03-66 | 10 | 111 | 2 |
| SO Bb 14 | SO-73-1880 | LAST CHANCE MARINA | SWD | 03-30-81 | 10 | 150 | 2 |
| SO Bb 15 | SO-73-1490 | ISLAND SEAFOOD INC | KELLY | 06-26-79 | 10 | 130 | 4 |
| SO Bb 16 | SO-67-0070 | SOMERSET SEAFOOD CO | FORD | 10-26-66 | 5 | 126 | 2 |
| SO Bb 17 | SO-73-0296 | ISLAND SEAFOOD INC | FORD | 05-28-74 | 10 | 133 | 2 |
| SO Bb 18 | SO-81-0586 | EASTERN SHORE OIL CO | SWD | 06-19-85 | 10 | 140 | 2 |
| SO Bb 19 | | SOMERSET SEAFOOD CO | S. SHANNAHAN | 12-01-58 | 5 | 720 | 4<br>2.5 |
| SO Bb 20 | SO-81-0675 | RUSSELL, SYLVAN | SWD | 08-10-85 | 8 | 150 | 2 |
| SO Bb 21 | SO-81-0743 | WINDSOR, ROY | SWD | 11-01-85 | 8 | 140 | 2 |
| SO Bb 22 | SO-81-0749 | SUHR, FRED | SWD | 10-25-85 | 8 | 160 | 2 |
| SO Bb 23 | SO-81-0900 | LOU, FRANK | SWD | 06-17-86 | 8 | 160 | 2 |
| SO Bb 24 | SO-81-0820 | SCOTTS COVE MARINA | SWD | 04-04-86 | 8 | 150 | 2 |
| SO Bc 1 | SO-00-8344 | DASHIELL, ELMER | WHITE | 08-00-51 | 5 | 131 | 2 |
| SO Bc 2 | SO-00-5242 | BOZMAN, HARRY L | WHITE | 02-15-50 | 5 | 105 | 2 |
| SO Bc 3 | SO-00-5186 | STARK, W G | WHITE | 02-13-50 | 5 | 105 | 2 |
| SO Bc 4 | SO-00-5243 | WEBSTER, BAIN D | WHITE | 02-20-50 | 5 | 135 | 2 |
| SO Bc 5 | SO-00-0842 | WALLACE, VAUGHN | TODD | 09-23-46 | 5 | 122 | 1.5 |
| SO Bc 6 | SO-00-3753 | MCDORMAN, WALTER F | WHITE | 03-30-49 | 5 | 127 | 2 |
| SO Bc 7 | SO-00-1583 | MESSICK, HENRY | FARLOW | 06-28-47 | 5 | 139 | 2 |
| SO Bc 8 | SO-00-6147 | CAREW, BROOKS | CUSICK | 06-30-50 | 5 | 147 | 1.5 |
| SO Bc 9 | -- | WEBSTER, MASON | WHITE | 00-00-50 | 5 | 132 | 2 |
| SO Bc 10 | SO-00-5985 | WEBSTER, MASON | WHITE | 06-00-50 | 5 | 95 | 2 |
| SO Bc 11 | SO-00-2098 | HOPKINS, FORD | WHITE | 12-30-47 | 5 | 90 | 2 |
| SO Bc 12 | SO-00-3207 | WALLACE, HARWOOD | WHITE | 10-07-48 | 5 | 135 | 2 |
| SO Bc 13 | -- | JONES, MONROE | -- | 1882 | 5 | 6.5 | 24 |
| SO Bc 14 | SO-01-3230 | SOMERSET CO. BOARD OF ED | WHITE | 09-00-53 | 5 | 132 | 2 |
| SO Bc 15 | SO-73-0366 | MACEDONIA UNITED METHODIST CH | FORD | 11-05-74 | 4 | 140 | 2 |
| SO Bc 16 | SO-81-0818 | HOWARD, JOE | SWD | 06-12-86 | 5 | 120 | 4 |
| SO Bc 17 | SO-81-0799 | DUNN, GREG | SWD | 02-28-86 | 5 | 120 | 2 |
| SO Bc 18 | SO-81-0719 | JONES, ROGER | SWD | 09-09-85 | 5 | 140 | 2 |
| SO Bc 19 | SO-81-0690 | CULVER, DONALD | SWD | 08-15-85 | 5 | 125 | 4 |
| SO Bd 1 | SO-00-0383 | MCINTYRE, ROSS | WHITE | 05-11-46 | 10 | 136 | 2 |
| SO Bd 2 | SO-00-0384 | MCINTYRE, NEARY | WHITE | 05-10-46 | 10 | 136 | 2 |
| SO Bd 3 | SO-00-0385 | DASHIELL, JENNIE H | WHITE | 05-07-46 | 10 | 139 | 2 |
| SO Bd 4 | SO-00-8132 | EISNOR, EDNA | WHITE | 07-00-51 | 5 | 107 | 2 |
| SO Bd 5 | SO-00-8345 | DUNTON, EDGAR L | WHITE | 09-00-51 | 15 | 150 | 2 |
| SO Bd 6 | SO-00-6980 | HORNER, JOHN W | WHITE | 11-00-50 | 5 | 101 | 2 |
| SO Bd 7 | SO-00-0734 | PARKS, JAMES | WHITE | 09-21-46 | 5 | 94 | 2 |
| SO Bd 8 | SO-00-3208 | CAUSEY, HARRY | WHITE | 10-08-48 | 5 | 104 | 2 |
| SO Bd 9 | SO-00-0735 | SIMMS, CLARK I | WHITE | 09-24-46 | 5 | 98 | 2 |
| SO Bd 10 | SO-00-6060 | DASHIELL, HERMAN | WHITE | 04-00-50 | 5 | 122 | 2 |
| SO Bd 11 | SO-00-9181 | KOHLHEIM, R J | CUSICK | 12-03-51 | 10 | 178 | 1.5 |
| SO Bd 12 | SO-00-6337 | KOHLHEIM, R J | CUSICK | 07-29-50 | 10 | 179 | 1.5 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-546 | | | | +.5f | 09-13-47 | -- | 30 | 14 | -- | C | SO Bb 1 |
| 546-609 | -- | 609 -659 | 124PNPN | 1 | 06-27-50 | | | | | | |
| 659-671 | | | | | | | | | | | |
| 144 | 1.5 | 136 -142 | 122MNKN | 8 | 10-17-46 | -- | 10 | 8 | -- | H | SO Bb 2 |
| 122 | 2 | 110.5-120.5 | 122MNKN | 3 | 05-15-46 | -- | 40 | 2 | -- | U | SO Bb 3 |
| 140 | -- | 132 -138 | 122MNKN | 8 | 10-20-46 | -- | 10 | 8 | -- | H | SO Bb 4 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Bb 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bb 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bb 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bb 8 |
| 132 | 2 | 140 | 122MNKN | 11 | 11-06-75 | 6 | 30 | 1 | 5.0 | T | SO Bb 9 |
| 105 | 2 | 115 | 122MNKN | 7 | 12-01-81 | 5 | 25 | 3 | 5.0 | C | SO Bb 10 |
| 120 | 2 | 135 | 122MNKN | 5 | 09-10-76 | 2 | 10 | 2 | 5.0 | T | SO Bb 11 |
| 12 | -- | 15 | 112PCPC | 3 | 10-28-77 | 2 | 4 | 1 | 2.0 | H | SO Bb 12 |
| 105 | 2 | 111 | 122MNKN | 7 | 08-03-66 | 11 | 14 | 1 | 1.3 | P | SO Bb 13 |
| 130 | 2 | 150 | 122MNKN | 10 | 03-30-81 | 4 | 8 | 1 | 2.0 | C | SO Bb 14 |
| 105 | 4 | 125 | 122MNKN | 6 | 06-26-79 | 19 | 15 | 3 | .8 | C | SO Bb 15 |
| 112 | 2 | 126 | 122MNKN | 4.1m | 04-16-87 | -- | 10 | 2 | -- | C | SO Bb 16 |
| 113 | 2 | 133 | 122MNKN | 6 | 05-28-74 | 2 | 15 | 3 | 7.5 | C,N | SO Bb 17 |
| 120 | 2 | 140 | 122MNKN | 5 | 06-19-85 | 5 | 30 | 1 | 6.0 | C | SO Bb 18 |
| 151 | | | | -- | -- | -- | -- | -- | -- | C | SO Bb 19 |
| 524 | | | 124PNPN | | | | | | | | |
| 130 | 2 | 150 | 122MNKN | 5 | 08-10-85 | 5 | 25 | 1 | 5.0 | H | SO Bb 20 |
| 120 | 2 | 140 | 122MNKN | 5 | 11-01-85 | 5 | 30 | 1 | 6.0 | H | SO Bb 21 |
| 140 | 2 | 160 | 122MNKN | 6 | 10-25-85 | 2 | 35 | 1 | 18 | H | SO Bb 22 |
| 140 | 2 | 160 | 122MNKN | 10 | 06-17-86 | 2 | 60 | 1 | 30 | H | SO Bb 23 |
| 130 | 2 | 150 | 122MNKN | 3 | 04-04-86 | 1 | 50 | 1 | 50 | C | SO Bd 24 |
| 123 | 2 | 131 | 122MNKN | .5 | 08-00-51 | -- | 10 | 5 | -- | H | SO Bc 1 |
| 105 | 2 | 95 -103 | 122MNKN | 3 | 02-15-50 | -- | 10 | 2 | -- | H | SO Bc 2 |
| 105 | 2 | 95 -103 | 122MNKN | 3 | 02-13-50 | -- | 10 | 3 | -- | H | SO Bc 3 |
| 135 | 2 | 125 -133 | 122MNKN | 4 | 02-20-50 | -- | 8 | 6 | -- | H | SO Bc 4 |
| 116 | -- | 122 | 122MNKN | 8 | 09-23-46 | -- | 10 | 8 | -- | H | SO Bc 5 |
| 115 | 2 | 126 | 122MNKN | .5 | 03-30-49 | -- | 15 | 2 | -- | H | SO Bc 6 |
| 139 | 2 | 129.5-137.5 | 122MNKN | 1 | 06-28-47 | -- | 8 | 2 | -- | U | SO Bc 7 |
| | | | | 5.5m | 01-06-52 | | | | | | |
| 137 | -- | 147 | 122MNKN | 2 | 06-30-50 | 1 | 15 | 2 | 15 | H | SO Bc 8 |
| -- | -- | -- | 122MNKN | 8 | 00-00-50 | -- | -- | -- | -- | P | SO Bc 9 |
| 87 | 2 | 95 | 122MNKN | 1.5 | 06-00-50 | -- | 16 | 2 | -- | H | SO Bc 10 |
| 78 | 2 | 90 | 122MNKN | -- | -- | -- | 20 | 1 | -- | H | SO Bc 11 |
| 123 | -- | 135 | 122MNKN | .5 | 10-07-48 | -- | 17 | 2 | -- | H | SO Bc 12 |
| -- | -- | -- | 112PCPC | 2.0m | 03-13-52 | -- | -- | -- | -- | H,S | SO Bc 13 |
| 121 | 2 | 133 | 122MNKN | 1.5 | 09-00-53 | -- | 12 | 3 | -- | T | SO Bc 14 |
| | | | | 1.8m | 01-19-54 | | | | | | |
| 130 | 2 | 140 | 122MNKN | 5 | 11-05-74 | 2 | 10 | 2 | 5.0 | T | SO Bc 15 |
| 100 | 4 | 120 | 122MNKN | 7 | 06-12-86 | 5 | 50 | 1 | 10 | H | SO Bc 16 |
| | | | | 5.5m | 12-11-86 | | | | | | |
| 100 | 2 | 120 | 122MNKN | 3 | 02-28-86 | 1 | 40 | 1 | 40 | H | SO Bc 17 |
| 120 | 2 | 140 | 122MNKN | 8 | 09-09-85 | 1 | 45 | 1 | 45 | H | SO Bc 18 |
| 100 | 2 | 125 | 122MNKN | 7 | 08-15-85 | 3 | 40 | 1 | 13 | H | SO Bc 19 |
| 126 | 2 | 136 | 122MNKN | 2 | 05-11-46 | -- | -- | -- | -- | H | SO Bd 1 |
| 136 | -- | 126.5-134.5 | 122MNKN | 4 | 05-10-46 | -- | 50 | 2 | -- | H | SO Bd 2 |
| 139 | 2 | 127.5-137.5 | 122MNKN | 3 | 05-07-46 | -- | 40 | 2 | -- | H | SO Bd 3 |
| 99 | 2 | 107 | 122MNKN | +1.5 | 07-00-51 | -- | -- | -- | -- | H | SO Bd 4 |
| 138 | 2 | 150 | 122MNKN | 3 | 09-00-51 | -- | 12 | 3 | -- | U | SO Bd 5 |
| 93 | 2 | 101 | 122MNKN | 6 | 11-00-50 | -- | 10 | 1.5 | -- | H | SO Bd 6 |
| 86 | 2 | 94 | 122MNKN | 2 | 09-21-46 | -- | 15 | 2 | -- | H | SO Bd 7 |
| 92 | 2 | 104 | 122MNKN | 3 | 10-08-48 | -- | 18 | 2 | -- | H | SO Bd 8 |
| 92 | 2 | 98 | 122MNKN | 3 | 09-24-46 | -- | 12 | 2 | -- | H | SO Bd 9 |
| 112 | 2 | 122 | 122MNKN | +1.5 | 04-00-50 | -- | 15 | 3 | -- | H | SO Bd 10 |
| 158 | 1.5 | 178 | 122MNKN | 3 | 12-03-51 | 2 | 22 | 2 | 11 | U | SO Bd 11 |
| | | | | 2.8m | 01-16-52 | | | | | | |
| 164 | 1.5 | 179 | 122MNKN | 1.5 | 07-29-50 | 1 | 20 | 2 | 20 | H | SO Bd 12 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; CD&P = Coastal Drilling and Pump; SAW = Shannahan Art. Well; USGS = U.S. Geological Survey; MD. WRA = Maryland Water Resources Administration]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Bd 13 | SO-00-2097 | ST. PETERS CHURCH TRUSTEES | WHITE | 11-22-47 | 5 | 145 | 2 |
| SO Bd 14 | SO-00-0457 | MELSON, MATT | FARLOW | 05-17-41 | 5 | 143 | 2 |
| SO Bd 15 | SO-00-0456 | REESE, J B | WHITE | 05-22-46 | 5 | 144 | 2 |
| SO Bd 16 | SO-00-4988 | FARLOW, JAMES M | WHITE | 02-00-50 | 10 | 136 | 2 |
| SO Bd 17 | -- | NOBLE, TOM | WHITE | 03-00-52 | 10 | 148 | 2 |
| SO Bd 18 | -- | WILLING, DENWOOD | -- | 00-00-41 | 5 | 22 | 1.25 |
| SO Bd 19 | -- | SEARS, LEANORD | -- | 00-00-49 | 10 | 51 | 1.5 |
| SO Bd 20 | -- | MADDOX, OSCAR | -- | 12-00-51 | 5 | 25 | 1.5 |
| SO Bd 21 | -- | TILGHMAN, OTHO | -- | 00-00-42 | 5 | 150 | 2 |
| SO Bd 22 | -- | BOZMAN, WESLEY | -- | 00-00-44 | 5 | 38.5 | 1.5 |
| SO Bd 23 | -- | BOZMAN, JAMES | TODD | 00-00-40 | 5 | 160 | 1.5 |
| SO Bd 24 | -- | DIZE, THOMAS | JARRETT | 00-00-44 | 5 | 160 | 1.5 |
| SO Bd 25 | -- | HALL, GEORGE | -- | 00-00-50 | 5 | 160 | 2 |
| SO Bd 26 | -- | DASHIEL, NATT | -- | 00-00-37 | 5 | 20 | 1.25 |
| SO Bd 27 | -- | FITZGERALD, HARRY | -- | 00-00-12 | 5 | 25 | 1.5 |
| SO Bd 28 | SO-00-1789 | WHITE, CLARENCE E | CUSICK | 09-18-47 | 5 | 136 | 1.5 |
| SO Bd 29 | -- | NOBLE, HARRY | -- | 00-00-44 | 5 | 165 | 2 |
| SO Bd 30 | -- | JONES, EDGAR | -- | 00-00-03 | 5 | 80 | 1.5 |
| SO Bd 32 | SO-67-0065 | MONIE CREEK GUN CLUB | FORD | 10-21-66 | 5 | 117 | 2 |
| SO Bd 33 | SO-81-0343 | MT. VERNON FIRE CO | SWD | 06-05-84 | 10 | 140 | 2 |
| SO Bd 34 | SO-71-0011 | ASBURY METHODIST CHURCH | FORD | 08-26-70 | 10 | 105 | 2 |
| SO Bd 35 | SO-73-1362 | MT. VERNON PACKING CO | SWD | 10-08-78 | 5 | 120 | 2 |
| SO Bd 36 | SO-81-0178 | WHITE, TOM | CD&P | 03-17-83 | 10 | 150 | 8 |
| | | | | | | | 8 |
| SO Bd 37 | -- | WHITE, TOM | CD&P | 00-00-83 | 10 | 75 | 8 |
| SO Bd 38 | SO-73-0985 | MUIR, JENNINGS | DASHIELL DRLNG | 04-13-77 | 10 | 180 | 2 |
| SO Bd 39 | SO-71-0030 | VENTON METHODIST CHURCH | FORD | 09-23-70 | 10 | 148 | 2 |
| SO Bd 40 | SO-67-0056 | ST. PETERS METHODIST CH | FORD | 10-22-66 | 5 | 105 | 2 |
| SO Bd 41 | SO-81-0999 | U.S. GEOLOGICAL SURVEY | USGS | 11-01-86 | 5 | 15 | 2 |
| SO Bd 42 | -- | U.S. GEOLOGICAL SURVEY | MD. WRA | 03-13-87 | 5 | 138 | 15 |
| SO Bd 43 | SO-81-0832 | BOUNDS, MARY | DASHIELL | 04-15-86 | 5 | 150 | 2 |
| SO Bd 44 | SO-81-0814 | LAWRENCE, MORRIS | SWD | 04-01-86 | 8 | 170 | 2 |
| SO Bd 45 | SO-81-0912 | ANDERSON, LANKFORD | SWD | 07-20-86 | 5 | 160 | 2 |
| SO Bd 46 | SO-81-0854 | BEDSWORTH, JERRY | SWD | 05-06-86 | 8 | 160 | 2 |
| SO Be 1 | -- | U.S. GEOLOGICAL SURVEY | USGS | 08-16-49 | 20 | 22.5 | 1.25 |
| SO Be 2 | -- | TOWN OF PRINCESS ANNE | SAW | 00-00-45 | 20 | 83 | 6 |
| SO Be 3 | SO-00-8260 | REYNOLDS, ROBERT | CUSICK | 07-21-51 | 20 | 200 | 1.5 |
| SO Be 4 | SO-00-2498 | SMITH, ROY W | WHITE | 07-26-48 | 20 | 187 | 2 |
| SO Be 5 | SO-00-7351 | LONG, EARL | WHITE | 05-00-51 | 10 | 151 | 2 |
| SO Be 6 | SO-00-0917 | BENSON, FRED E | CUSICK | 11-08-46 | 20 | 196 | 2 |
| SO Be 7 | SO-00-1064 | BOZMAN, HERMAN | WHITE | 12-28-46 | 15 | 183.5 | 3 |
| | | | | | | | 2 |
| | | | | | | | 2 |
| SO Be 8 | SO-00-0945 | KEAN, DAVID B | CUSICK | 11-15-46 | 15 | 196 | 2 |
| SO Be 9 | SO-00-7350 | POLLITT, EDWARD | WHITE | 02-00-51 | 10 | 203 | 2 |
| SO Be 10 | SO-00-0665 | CARTER, HARRY | WHITE | 09-14-46 | 10 | 194 | 3 |
| | | | | | | | 2 |
| | | | | | | | -- |
| SO Be 11 | SO-00-6522 | STROBLE, ERVIN E | CUSICK | 08-21-50 | 15 | 188 | 1.5 |
| SO Be 12 | SO-00-5566 | PORTER, JAMES | WHITE | 05-00-50 | 15 | 170 | 2 |
| SO Be 13 | SO-00-8870 | GORDY, FRED O | CUSICK | 10-24-51 | 20 | 208 | 1.5 |
| SO Be 14 | SO-00-5410 | PUSEY, VADOR MRS | CUSICK | 04-05-50 | 17 | 212 | 1.5 |
| SO Be 15 | SO-00-7209 | PUSEY, ELLA MRS | CUSICK | 01-03-51 | 15 | 198 | 1.5 |
| SO Be 16 | SO-00-7595 | CARROW, T LESTER MRS | CUSICK | 05-01-51 | 15 | 188 | 1.5 |
| SO Be 17 | SO-00-5567 | SIMPKINS, DOUGLAS | WHITE | 05-05-50 | 20 | 180 | 2 |
| SO Be 18 | SO-00-8876 | PINTO, ROBERT | CUSICK | 11-21-51 | 15 | 200 | 1.5 |
| SO Be 19 | SO-00-5916 | RUSSELL, HARVEY | WHITE | 05-00-50 | 15 | 166 | 2 |
| SO Be 20 | -- | BLACK, MRS | -- | 00-00-51 | 15 | 15 | 1.5 |
| SO Be 21 | -- | DRYDEN, ALTON | MUIR | 00-00-47 | 20 | 30 | 1.5 |
| SO Be 22 | -- | MEREDITH, C E | -- | 00-00-41 | 10 | 22 | 1.5 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 145 | 2 | 135.5-143.5 | 122MNKN | +.5 | 11-22-47 | -- | 15 | 1.5 | -- | T | SO Bd 13 |
| 143 | 2 | 131.5-141.5 | 122MNKN | 3 | 05-17-46 | -- | 30 | 2 | -- | H | SO Bd 14 |
| 138 | 2 | 144 | 122MNKN | 4 | 05-22-46 | -- | 30 | 2 | -- | H | SO Bd 15 |
| 126 | 2 | 134 | 122MNKN | 2 | 02-00-50 | -- | 10 | 2 | -- | H | SO Bd 16 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Bd 17 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bd 18 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H | SO Bd 19 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bd 20 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Bd 21 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bd 22 |
| -- | -- | -- | 122MNKN | +1 | 00-00-40 | -- | -- | -- | -- | H,S | SO Bd 23 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Bd 24 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Bd 25 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bd 26 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bd 27 |
| 126 | 1.5 | 136 | 122MNKN | 2 | 09-18-47 | 3 | 28 | 2 | 9.3 | H | SO Bd 28 |
| -- | -- | -- | 122MNKN | +.5 | 01-19-54 | -- | -- | -- | -- | H | SO Bd 29 |
| -- | -- | -- | 122MOCN | +1.5 | 00-00-03 | -- | -- | -- | -- | U | SO Bd 30 |
| 109 | 2 | 117 | 122MNKN | 1 | 10-21-66 | -- | 10 | 2 | -- | Z | SO Bd 32 |
| 105 | 2 | 140 | 122MNKN | 12 | 06-05-84 | 2 | 10 | 1 | 5.0 | T | SO Bd 33 |
| 97 | -- | 105 | 122MNKN | 7 | 08-26-70 | 3 | 10 | 2 | 3.3 | T | SO Bd 34 |
| 100 | 2 | 120 | 122MNKN | 8 | 10-08-78 | 4 | 11 | 1 | 2.8 | C | SO Bd 35 |
| +1 - 15 | 8 | 15 - 35 | 112PCPC | 8 | 03-17-83 | 22 | 700 | 4 | 32 | I | SO Bd 36 |
| 35 - 90 | 8 | 90 -150 | 122MNKN | | | | | | | | |
| -- | -- | -- | 112PCPC | 4.0m | 06-26-86 | -- | -- | -- | -- | U | SO Bd 37 |
| | | | 122MNKN | | | | | | | | |
| 172 | 2 | 180 | 122MNKN | 11 | 04-13-77 | 8 | 15 | 1 | 1.9 | C | SO Bd 38 |
| 140 | -- | 148 | 122MNKN | 7 | 09-23-70 | 3 | 10 | 2 | 3.3 | T | SO Bd 39 |
| 97 | 2 | 105 | 122MNKN | 1 | 10-22-66 | -- | 10 | 2 | -- | Z | SO Bd 40 |
| 10 | 2 | 15 | 112PCPC | 2.2m | 04-14-87 | -- | -- | -- | -- | U | SO Bd 41 |
| 80 | 2 | 90 | 122MNKN | 5.1m | 04-14-87 | -- | -- | -- | -- | U | SO Bd 42 |
| 140 | 2 | 150 | 122MNKN | 12 | 04-15-86 | 5 | 20 | 1 | 4 | H | SO Bd 43 |
| 150 | 2 | 170 | 122MNKN | 6 | 04-01-86 | 1 | 60 | 1 | 60 | H | SO Bd 44 |
| 140 | 2 | 160 | 122MNKN | 9 | 07-20-86 | 1 | 75 | 1 | 75 | S | SO Bd 45 |
| 140 | 2 | 160 | 122MNKN | 15 | 05-06-86 | 3 | 30 | 1 | 10 | H | SO Bd 46 |
| 22.5 | -- | -- | 112PCPC | 3.9m | 08-16-49 | -- | -- | -- | -- | U | SO Ba 1 |
| -- | -- | -- | 122PCMK | 14 | 00-00-45 | 13 | 105 | -- | 8.1 | P | SO Ba 2 |
| 180 | 1.5 | 200 | 122MNKN | 2 | 07-21-51 | 7 | 30 | 3 | 4.3 | H | SO Ba 3 |
| 187 | 2 | 173.5-185.5 | 122MNKN | 4 | 07-26-48 | -- | 8 | 3 | -- | H,S | SO Ba 4 |
| 138 | 2 | 150 | 122MNKN | 1 | 05-00-51 | -- | 16 | 4 | -- | H,S | SO Ba 5 |
| 168 | 2 | 196 | 122MNKN | 3 | 11-08-46 | 1 | 20 | 3 | 20 | H,S | SO Ba 6 |
| 0 -105 | | | | 7 | 12-28-46 | -- | 18 | 4 | -- | H,S | SO Ba 7 |
| 105 -170 | 2 | 170 -182 | 122MNKN | | | | | | | | |
| 182 -183.5 | | | | | | | | | | | |
| 174 | 2 | 196 | 122MNKN | 3 | 11-15-46 | .5 | 20 | 1 | 40 | H | SO Ba 8 |
| 190 | 2 | 202 | 122MNKN | 3 | 02-00-51 | -- | 10 | 4 | -- | H,S | SO Ba 9 |
| 0 - 84 | | | | 3 | 09-14-46 | -- | 12 | 3 | -- | H,S | SO Ba 10 |
| 84 -180.5 | 2 | 180.5-192.5 | 122MNKN | | | | | | | | |
| 192.5-194 | | | | | | | | | | | |
| 178 | 1.5 | 188 | 122MNKN | 6.0 | 08-21-50 | 2 | 20 | 2 | 10 | H | SO Ba 11 |
| 158 | 2 | 170 | 122MNKN | 4.5 | 05-00-50 | -- | 12 | 3 | -- | H | SO Ba 12 |
| 193 | 1.5 | 208 | 122MNKN | 4 | 10-24-51 | 1 | 22 | 3 | 22 | H | SO Ba 13 |
| 197 | 1.5 | 212 | 122MNKN | 4 | 04-05-50 | -- | -- | -- | -- | H,S | SO Ba 14 |
| 183 | 1.5 | 198 | 122MNKN | 3 | 01-03-51 | 4 | 25 | 2 | 6.3 | H | SO Ba 15 |
| 173 | 1.5 | 188 | 122MNKN | 2 | 05-01-51 | 5 | 25 | 2 | 5.0 | H | SO Ba 16 |
| 168 | 2 | 180 | 122MNKN | -- | -- | -- | 12 | 6 | -- | C,H | SO Ba 17 |
| 180 | 1.5 | 200 | 122MNKN | 5 | 11-21-51 | 2 | 30 | 3 | 15 | H,S | SO Ba 18 |
| 154 | 2 | 166 | 122MNKN | 4 | 05-00-50 | -- | 10 | 3 | -- | P | SO Ba 19 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ba 20 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ba 21 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ba 22 |

TABLE 14

RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; f = flowing well; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Be 23 | -- | ADAMS, M H | WHITE | 00-00-48 | 15 | 210 | 1.5 |
| SO Be 24 | -- | LONG, E W | -- | 00-00-12 | 15 | 20 | 1.25 |
| SO Be 25 | -- | MILLER, J B | -- | 00-00-47 | 10 | 20 | 1.5 |
| SO Be 26 | -- | BRIDDELL, A E | -- | 00-00-12 | 10 | 20 | 36 |
| SO Be 27 | -- | ADAMS, M | -- | 00-00-51 | 15 | 20 | 1.5 |
| SO Be 28 | -- | -- | -- | -- | 20 | 20 | 1.5 |
| SO Be 29 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 10 | 32.3 | -- |
| SO Be 30 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 26.3 | -- |
| SO Be 31 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 10 | 27.9 | -- |
| SO Be 32 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 23.5 | -- |
| SO Be 33 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 34.5 | -- |
| SO Be 34 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 33.0 | -- |
| SO Be 35 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 34.5 | -- |
| SO Be 36 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 34.9 | -- |
| SO Be 37 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 26.8 | -- |
| SO Be 38 | -- | TOWN OF PRINCESS ANNE | CANNON | 00-00-18 | 20 | 25.1 | -- |
| SO Be 39 | -- | UNIV. OF MD EASTERN SHORE | CUSTIS | 00-00-29 | 10 | 196 | 2 |
| SO Be 40 | -- | UNIV. OF MD EASTERN SHORE | CUSTIS | 00-00-29 | 10 | 204 | 2 |
| SO Be 41 | -- | SUPPLEE, WILLS, JONES | PENTZ | 04-00-42 | 10 | 60 | 3 |
| SO Ba 42 | -- | SMITH, E MACE | WHITE | 00-00-29 | 20 | 184 | 2 |
| SO Be 43 | SO-01-0639 | FITZGERALD, JOHN H | CUSICK | 10-01-52 | 20 | 203 | 1.5 |
| SO Be 44 | SO-00-9787 | DYKES, HERMAN | CUSICK | 04-30-52 | 20 | 189 | 1.5 |
| SO Be 45 | SO-00-9913 | LAYFIELD, PHILLIP MRS | WHITE | 06-00-52 | 15 | 213 | 2 |
| SO Be 46 | SO-00-9848 | POWELL, ELMER | WHITE | 05-00-52 | 15 | 209 | 2 |
| SO Be 47 | SO-00-9849 | CARTER, WILLIAM | WHITE | 05-00-52 | 15 | 204 | 2 |
| SO Be 48 | SO-01-1188 | TAYLOR, EUGENE | WHITE | 11-00-52 | 10 | 188 | 2 |
| SO Be 49 | -- | TOWN OF PRINCESS ANNE | KELLY WELL | 00-00-28 | 20 | 64 | 24 -18 |
| SO Be 50 | SO-01-1924 | TOWN OF PRINCESS ANNE | SYDNOR P&W | 03-01-53 | 20 | 419 | -- |
| SO Be 51 | SO-01-1924 | TOWN OF PRINCESS ANNE | SYDNOR P&W | 08-14-53 | 20 | 214 | 16<br>10 |
| SO Be 52 | SO-01-2429 | TOWN OF PRINCESS ANNE | SYDNOR P&W | 05-15-53 | 20 | 77 | 8 |
| SO Be 53 | SO-65-0054 | CUSTOM PET FOOD PACKERS, INC | LAYNE-ATLNTC | 11-00-64 | 5 | 262 | -- |
| SO Be 54 | SO-67-0126 | SOMERSET CO. SANITARY COMM | IWD | 06-08-67 | 5 | 260 | 6 |
| SO Be 55 | SO-81-0558 | STATE OF MARYLAND | LAYNE-ATLNTC | 04-18-85 | 12 | 250 | 10 |
| SO Ba 56 | SO-81-0471 | SOMERSET CO. SANITARY COMM | DELMARVA DRLNG | 05-14-85 | 15 | 255 | 12 |
| SO Be 57 | SO-81-0630 | STATE OF MARYLAND | LAYNE-ATLNTC | 05-30-85 | 12 | 220 | 4 |
| SO Be 58 | SO-73-0628 | SOMERSET ANIMAL HOSPITAL | FORD | 01-21-76 | 20 | 200 | 2 |
| SO Be 59 | SO-73-1453 | PERDUE FARMS INC | SWD | 03-26-79 | 20 | 210 | 2 |
| SO Ba 60 | SO-73-0690 | DYKES FRUIT AND PRODUCE | FORD | 04-21-76 | 20 | 200 | 2 |
| SO Ba 61 | SO-73-0090 | CHOPTANK ELECTRIC COOP | IWD | 07-26-73 | 10 | 85 | 4 |
| SO Be 62 | SO-73-0991 | CHELTONS'S WELDING SERVICE | FORD | 07-08-77 | 20 | 101 | 2 |
| SO Be 63 | SO-73-0804 | CORBETT BREEDERS, INC | DASHIELL DRLNG | 07-13-76 | 20 | 194 | 2 |
| SO Be 64 | SO-73-0883 | CORBETT BREEDERS, INC | DASHIELL DRLNG | 12-21-77 | 20 | 194 | 2 |
| SO Be 65 | SO-73-1115 | LAYFIELD AUTO PARTS | FORD | 11-04-77 | 20 | 180 | 2 |
| SO Be 66 | SO-68-0009 | SMITH, WILLARD | FORD | 08-21-67 | 20 | 173 | 2 |
| SO Be 67 | SO-70-0065 | CUSTOM PET FOOD PACKERS, INC | FORD | 03-02-70 | 10 | 176 | 2 |
| SO Be 68 | SO-70-0066 | CUSTOM PET FOOD PACKERS, INC | FORD | 03-02-70 | 10 | 171 | 2 |
| SO Be 69 | SO-70-0081 | CUSTOM PET FOOD PACKERS, INC | FORD | 04-28-70 | 10 | 180 | 4 |
| SO Be 70 | SO-66-0055 | FIRST BAPTIST CHURCH | FORD | 12-29-65 | 10 | 188 | 2 |
| SO Be 71 | SO-81-0607 | MOUNTAIRE HATCHERY | SWD | 05-17-85 | 20 | 230 | 4<br>3 |
| SO Be 72 | SO-73-1948 | NICHOLS, THOMAS | SWD | 08-30-81 | 20 | 90 | 2 |
| SO Be 73 | SO-73-0018 | TOWN OF PRINCESS ANNE | IWD | 09-07-73 | 10 | 51 | 4 |
| SO Be 76 | SO-73-0763 | UNIV. OF MD EASTERN SHORE | IWD | 08-30-76 | 20 | 200 | 6 |
| SO Be 77 | SO-81-0760 | UNIV. OF MD EASTERN SHORE | DELMARVA DRLNG | 03-04-86 | 20 | 75 | 6 |
| SO Be 78 | SO-73-0645 | SOMERSET CO. SANITARY COMM | IWD | 02-27-76 | 10 | 195 | 8 |
| SO Be 79 | SO-73-0837 | WHITTINGTON FARMS | KAUFFMAN | 04-26-78 | 10 | 63 | 15 |

| Bottom of casing or cased inter- vel (ft) | Diam- eter of screen (in.) | Bottom of screen or screened inter- vel (ft) | Aquifer code | Weter level (ft) | Dete weter level mees- ured | Drew- down (ft) | Dis- cherge (gel/ min) | Pumping period (hours) | Spe- cific cepe- city [(gel/ min)/ ft] | Use of weter | Locel well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 195 | 1.5 | 210 | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Be 23 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Be 24 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Be 25 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Be 26 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Be 27 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Be 28 |
| -- | -- | -- | 112PCPC | 13.0m | 01-15-52 | -- | -- | -- | -- | U | SO Be 29 |
| -- | -- | -- | 112PCPC | 11.3m | 01-15-52 | -- | -- | -- | -- | U | SO Be 30 |
| -- | -- | -- | 112PCPC | 11.8m | 01-15-52 | -- | -- | -- | -- | U | SO Be 31 |
| -- | -- | -- | 112PCPC | 15.5m | 01-15-52 | -- | -- | -- | -- | U | SO Be 32 |
| -- | -- | -- | 112PCPC | 15.4m | 01-15-52 | -- | -- | -- | -- | U | SO Be 33 |
| -- | -- | -- | 112PCPC | 15.7m | 01-15-52 | -- | -- | -- | -- | U | SO Be 34 |
| -- | -- | -- | 112PCPC | 15.7m | 01-15-52 | -- | -- | -- | -- | U | SO Be 35 |
| -- | -- | -- | 112PCPC | 15.7m | 01-15-52 | -- | -- | -- | -- | U | SO Be 36 |
| -- | -- | -- | 112PCPC | 14.4m | 01-15-52 | -- | -- | -- | -- | U | SO Be 37 |
| -- | -- | -- | 112PCPC | 13.9m | 01-15-52 | -- | -- | -- | -- | U | SO Be 38 |
| 192 | 2 | 196 | 122MNKN | 11 | 00-00-29 | -- | -- | -- | -- | U | SO Be 39 |
| 200 | 2 | 204 | 122MNKN | 11 | 00-00-29 | -- | 30 | -- | -- | U | SO Be 40 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | N | SO Be 41 |
| -- | -- | -- | 122MNKN | 42.6m | 04-15-87 | -- | -- | -- | -- | U | SO Be 42 |
| 188 | -- | 203 | 122MNKN | 6 | 10-01-52 | 1 | 28 | 2 | 28 | H,S | SO Be 43 |
| 174 | -- | 189 | 122MNKN | 5 | 04-30-52 | 6 | 20 | 2 | 3.3 | H,S | SO Be 44 |
| 203 | 2 | 213 | 122MNKN | 6 | 06-00-52 | -- | 12 | 3 | -- | H | SO Be 45 |
| 201 | 2 | 209 | 122MNKN | 2.5 | 05-00-52 | -- | 10 | 5 | -- | H | SO Be 46 |
| 191 | 2 | 204 | 122MNKN | 6 | 05-00-52 | -- | 10 | 2′ | -- | H | SO Be 47 |
| 172 | 2 | 188 | 122MNKN | 3 | 11-00-52 | -- | 10 | 4 | -- | H | SO Be 48 |
| 34 | -- | -- | 122PCMK | 10 | 00-00-28 | 23 | 435 | -- | 19 | P | SO Be 49 |
| -- | -- | -- | 122CPNK | -- | -- | -- | -- | -- | -- | U | SO Be 50 |
| .5-163 | | | | 7 | 08-14-53 | 133 | 350 | 24 | 2.6 | P | SO Be 51 |
| 0 -160.5 | 10 | 160.5-213.5 | 122MNKN | | | | | | | | |
| 54.5 | 8 | 75 | 122PCMK | 13 | 05-15-53 | 40 | 80 | 12 | 2.0 | P | SO Be 52 |
| -- | -- | -- | 122MNKN | -- | -- | -- | 25 | 5 | -- | U | SO Be 53 |
| 160 | 6 | 205 | 122MNKN | 27 | 06-08-67 | 78 | 135 | 30 | 1.7 | U | SO Be 54 |
| 165 | 10 | 240 | 122MNKN | 32 | 06-11-85 | 111 | 128 | 48 | 1.2 | U | SO Be 55 |
| 190 | 12 | 250 | 122MNKN | 28 | 05-29-85 | 117 | 500 | 24 | 4.3 | P | SO Be 58 |
| 170 | 4 | 220 | 122MNKN | ·25 | 05-30-85 | 50 | 50 | 2.5 | 1.0 | U | SO Be 57 |
| | | | | 29.7m | 04-15-87 | | | | | | |
| 180 | 2 | 200 | 122MNKN | 16 | 01-21-76 | 6 | 10 | 2 | 1.7 | C | SO Be 58 |
| 180 | 2 | 210 | 122MNKN | 16 | 03-26-79 | 194 | 12 | 2 | .06 | C | SO Be 59 |
| 180 | 2 | 200 | 122MNKN | 16 | 04-21-76 | 4 | 10 | 3 | 2.5 | C | SO Be 60 |
| 75 | 4 | 85 | 122PCMK | 18 | 07-26-73 | 7 | 20 | 4 | 2.9 | C | SO Be 61 |
| 86 | 2 | 101 | 122PCMK | 11 | 07-08-77 | 4 | 10 | 3 | 2.5 | C | SO Be 82 |
| 186 | 2 | 194 | 122MNKN | 9 | 07-13-76 | 5 | 20 | 1 | 4.0 | C | SO Be 63 |
| 186 | 2 | 194 | 122MNKN | 9 | 12-21-77 | 5 | 20 | 1 | 4.0 | C | SO Be 64 |
| 160 | 2 | 180 | 122MNKN | 17 | 11-04-77 | 6 | 10 | 2 | 1.7 | C | SO Be 65 |
| 157 | 2 | 173 | 122MNKN | 12 | 08-21-67 | -- | 10 | 2 | -- | C | SO Be 66 |
| 156 | -- | 176 | 122MNKN | 35 | 03-02-70 | 25 | 10 | 2 | .40 | N | SO Be 67 |
| 151 | -- | 171 | 122MNKN | 35 | 03-02-70 | 25 | 10 | 2 | .40 | N | SO Be 68 |
| 157 | -- | 177 | 122MNKN | 20 | 04-28-70 | 25 | 20 | 6 | .80 | N | SO Be 69 |
| 172 | 2 | 188 | 122MNKN | 22 | 12-29-65 | -- | 14 | 2 | -- | T | SO Be 70 |
| 170 | | | | 25 | 05-17-85 | 10 | 100 | 24 | 10 | N | SO Be 71 |
| 190 | 3 | 230 | 122MNKN | | | | | | | | |
| 60 | 2 | 90 | 122PCMK | 10 | 08-30-81 | 2 | 30 | 1 | 15 | I | SO Be 72 |
| 41 | 4 | 51 | 122PCMK | 12 | 09-07-73 | 18 | 100 | 3 | 5.6 | Z | SO Be 73 |
| - | 6 | -- | 122MNKN | -- | -- | -- | -- | -- | -- | I | SO Be 76 |
| 42 | 6 | 68 | 122PCMK | 9.8m | 04-16-87 | 10.4 | 33 | 1 | 3.2 | I | SO Be 77 |
| 151 | 8 | 191 | 122MNKN | 18 | 02-27-76 | 77 | 120 | 12 | 6 | P | SO Be 78 |
| 63 | 15 | 53 | 122PCMK | 5 | 04-26-78 | 33 | 800 | 38 | 24 | I | SO Be 79 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; CD&P = Coastal Drilling and Pumping; USGS = U.S. Geological Survey; IWD = Ideal Well Drillers]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Be 80 | SO-73-0839 | WHITTINGTON FARMS | KAUFFMAN | 04-28-77 | 20 | 63 | 15 |
| SO Be 81 | SO-73-1893 | HOUSE OF JACOBS | SWD | 04-21-81 | 20 | 165 | 2 |
| SO Be 82 | SO-67-0052 | LEE, IRVING S | FORD | 10-07-66 | 10 | 179 | 2 |
| SO Be 83 | SO-81-0451 | LEE, IRVING S | SWD | 08-07-84 | 10 | 200 | 2 |
| SO Be 84 | SO-71-0089 | LEE, IRVING S | FORD | 06-02-71 | 10 | 187 | 2 |
| SO Be 85 | SO-81-0216 | BOWEN, CHARLES | CD&P | 03-28-83 | 20 | 43 | 2 |
| SO Be 86 | SO-73-0897 | TWINING, CARL | IWD | 04-27-77 | 10 | 182 | 4 |
| SO Be 87 | SO-73-1872 | EAST, CRAIG | LARSON DRLNG | 04-20-81 | 10 | 83 | 12 |
| SO Be 88 | SO-73-0945 | W P HEARNE PRODUCE | WOOD | 04-06-77 | 20 | 73 | 8 |
| SO Be 89 | SO-73-1180 | W P HEARNE PRODUCE | WOOD | 04-05-78 | 20 | 80 | 8 |
| SO Be 90 | SO-73-1891 | BOUNTIFUL RIDGE NURSERY | BUNDICK | 06-01-81 | 10 | 55 | 4 |
| SO Be 91 | -- | NICHOLS, THOMAS | HALL | -- | 20 | -- | -- |
| SO Be 92 | -- | JACOB, GEORGE | FORD | 00-00-78 | 10 | 160 | 2 |
| SO Be 93 | SO-73-0743 | SMITH, EARL | FORD | 07-03-76 | 10 | 190 | 2 |
| SO Be 94 | SO-81-0827 | POLLITT, ROBERT | SWD | 06-20-86 | 15 | 85 | 2 |
| SO Be 95 | -- | POLLITT, ROBERT | HALL | -- | 20 | 225 | 2 |
| SO Be 96 | SO-81-0746 | POLLITT, ROBERT | HALL | 10-30-85 | 10 | 210 | 2 |
| SO Ba 97 | SO-81-0994 | U.S. GEOLOGICAL SURVEY | USGS | 12-11-86 | 20 | 15 | 2 |
| SO Be 98 | SO-81-0993 | U.S. GEOLOGICAL SURVEY | USGS | 12-12-86 | 15 | 15 | 2 |
| SO Be 99 | SO-81-0996 | U.S. GEOLOGICAL SURVEY | USGS | 12-12-86 | 20 | 15 | 2 |
| SO Be 100 | SO-81-0997 | U.S. GEOLOGICAL SURVEY | USGS | 12-15-86 | 15 | 20 | 2 |
| SO Be 101 | SO-81-0995 | U.S. GEOLOGICAL SURVEY | USGS | 12-15-86 | 15 | 16 | 2 |
| SO Be 102 | SO-81-0992 | U.S. GEOLOGICAL SURVEY | USGS | 12-16-86 | 15 | 14 | 2 |
| SO Be 103 | SO-81-0998 | U.S. GEOLOGICAL SURVEY | USGS | 12-16-86 | 15 | 22 | 2 |
| SO Be 107 | SO-81-0945 | KING, J COMILLOUS | DASHIELL DRLNG | 08-05-86 | 10 | 190 | 2 |
| SO Ba 110 | SO-81-0470 | SOMERSET CO. SANITARY COMM | DELMARVA DRLNG | 09-19-84 | 20 | 280 | 4 |
| SO Bf 1 | SO-00-5594 | PUSEY, R B | CUSICK | 04-12-50 | 30 | 232 | 2 |
| SO Bf 2 | -- | POWELL, RUSSELL | -- | -- | 25 | 11.3 | 24 |
| SO Bf 3 | -- | DOODY, R T | -- | 00-00-20 | 35 | 35.3 | 1.25 |
| SO Bf 4 | -- | LONG, F | BEAUCHAMP | 00-00-49 | 40 | 10.3 | 1.25 |
| SO Bf 5 | -- | PUSEY, S F | PUSEY | -- | 40 | 10 | 1.25 |
| SO Bf 6 | -- | DYKES, R | DYKES | 00-00-50 | 35 | 46 | 1.25 |
| SO Bf 7 | -- | WADDY, W A | BEAUCHAMP | 07-00-51 | 20 | 30 | 1.5 |
| SO Bf 8 | -- | WARWICK, L | BEAUCHAMP | 00-00-49 | 30 | 35 | 1.25 |
| SO Bf 9 | -- | ORVIS, C M | ORVIS | 00-00-42 | 30 | 26 | 1.25 |
| SO Bf 10 | -- | MILES, A | MILES | 00-00-43 | 30 | 21.5 | 1.25 |
| SO Bf 11 | -- | JENKINS, W | JENKINS | 00-00-52 | 35 | 36.5 | 1.25 |
| SO Bf 12 | -- | CANNON, MARGARET | -- | 00-00-47 | 20 | 50 | 1.25 |
| SO Bf 13 | SO-73-1076 | ST. MARKS UNITED METHODIST CH | FORD | 09-13-77 | 30 | 220 | 2 |
| SO Bf 14 | SO-81-0135 | WOOLFORD, STEPHEN | SWD | 08-17-82 | 20 | 245 | 4<br>3 |
| SO Bf 15 | SO-73-0885 | SMULLEN, GRACE | IWD | 01-28-77 | 40 | 250 | 4 |
| SO Bf 16 | SO-73-1527 | BROWN, PAUL | DASHIELL DRLNG | 07-10-79 | 40 | 240 | 4 |
| SO Bf 17 | SO-81-0595 | BROWN, PAUL | SWD | 05-03-85 | 40 | 230 | 4<br>3 |
| SO Bf 18 | SO-81-0207 | ROPER, VIRGIL | SWD | 02-28-83 | 20 | 200 | 4<br>3 |
| SO Bf 19 | SO-73-1361 | STEWART, WM E | WM BURNS | 07-25-79 | 30 | 210 | 4 |
| SO Bf 20 | SO-71-0005 | REYNOLDS, ALBERT | IWD | 07-16-70 | 30 | 27 | 4 |
| SO Bf 21 | SO-81-1016 | U.S. GEOLOGICAL SURVEY | USGS | 01-06-87 | 35 | 12 | 2 |
| SO Bf 22 | SO-81-0962 | ENNIS, CARROLL | SWD | 08-27-86 | 30 | 230 | 2 |
| SO Bf 23 | SO-81-0837 | BOSTON, JERRY | SWD | 04-18-86 | 20 | 240 | 2 |
| SO Bf 24 | SO-81-0862 | BRENT, SCOTT | LARSON WELLS | 05-08-86 | 25 | 178 | 2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 15 | 63 | 122PCMK | 6 | 04-28-77 | 29 | 800 | 3 | 28 | I | SO Be 80 |
| 140 | 2 | 165 | 122MNKN | 12 | 04-21-81 | 4 | 12 | 1 | 3.0 | T | SO Be 81 |
| 155 | 2 | 179 | 122MNKN | 14 | 10-07-66 | -- | 10 | 2 | -- | Z | SO Be 82 |
| 170 | 2 | 200 | 122MNKN | 10 | 08-07-84 | 4 | 10 | 1 | 2.5 | C | SO Be 83 |
| 167 | -- | 187 | 122MNKN | 22 | 06-02-71 | 7 | 10 | 2 | 1.4 | C | SO Be 84 |
| 33 | 2 | 43 | 122PCMK | 1 | 03-28-83 | 5 | 100 | 1 | 20 | I | SO Be 85 |
| 172 | 2 | 182 | 122MNKN | 23 | 04-27-77 | 27 | 20 | 4 | .74 | H | SO Be 86 |
| 20 | 12 | 60 | 122PCMK | 6 | 04-20-81 | 25 | 500 | 5 | 20 | I | SO Be 87 |
| | | | | 2.3m | 04-16-87 | | | | | | |
| 53 | 8 | 73 | 122PCMK | 7 | 04-06-77 | 3 | 10 | 8 | 3.3 | I | SO Be 88 |
| | | | | 3.9m | 04-16-87 | 4.2 | 73 | 1 | 17 | | |
| 40 | 8 | 80 | 122PCMK | 7 | 04-05-78 | 18 | 150 | 8 | 8.3 | I | SO Be 89 |
| | | | | 6.1m | 04-16-87 | | | | | | |
| 35 | 4 | 55 | 122PCMK | 6 | 06-01-81 | 36 | 25 | 6 | .69 | I | SO Be 90 |
| | | | | 3.8m | 04-16-87 | | | | | | |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Be 91 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Be 92 |
| 170 | 2 | 190 | 122MNKN | 12 | 07-03-76 | 3 | 10 | 2 | 3.3 | H | SO Be 93 |
| 65 | 2 | 85 | 122PCMK | 12 | 06-20-86 | 3 | 40 | 1 | 13.3 | I | SO Be 94 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | Z | SO Be 95 |
| 190 | 2 | 170 | 122MNKN | 29 | 10-30-85 | 2 | 40 | 1 | 20 | U | SO Be 96 |
| | | | | 30.3m | 04-16-87 | | | | | | |
| 10 | 2 | 15 | 112PCPC | 8.3m | 04-16-87 | -- | -- | -- | -- | U | SO Be 97 |
| 10 | 2 | 15 | 112PCPC | 7.7m | 04-16-87 | -- | -- | -- | -- | U | SO Be 98 |
| 10 | 2 | 15 | 112PCPC | 4.8m | 04-16-87 | -- | -- | -- | -- | U | SO Be 99 |
| 15 | 2 | 20 | 112PCPC | 6.4m | 04-16-87 | -- | -- | -- | -- | U | SO Be 100 |
| 11 | 2 | 16 | 112PCPC | 8.4m | 04-16-87 | -- | -- | -- | -- | U | SO Be 101 |
| 9 | 2 | 14 | 112PCPC | 4.8m | 04-16-87 | -- | -- | -- | -- | U | SO Be 102 |
| 17 | 2 | 22 | 112PCPC | 8.0m | 04-16-87 | -- | -- | -- | -- | U | SO Be 103 |
| 170 | 2 | 190 | 122MNKN | 25 | 08-05-86 | 3 | 20 | 1 | 6.6 | H | SO Be 107 |
| 180 | 4 | 230 | 122MNKN | 28 | 09-19-84 | 7 | 60 | 3 | 8.6 | U | SO Be 110 |
| 217 | -- | 232 | 122MNKN | 14 | 04-12-50 | 9 | 25 | 5 | 2.8 | H,S | SO Bf 1 |
| -- | -- | -- | 112PCPC | 2.3m | 02-06-52 | -- | -- | -- | -- | H,S | SO Bf 2 |
| -- | -- | -- | 112PCPC | 3.4m | 02-06-52 | -- | -- | -- | -- | H,S | SO Bf 3 |
| -- | -- | -- | 112PCPC | 1.3m | 02-06-52 | -- | -- | -- | -- | H | SO Bf 4 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bf 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Bf 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bf 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Bf 8 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bf 9 |
| -- | -- | -- | 112PCPC | 1.2m | 02-08-52 | -- | -- | -- | -- | H | SO Bf 10 |
| -- | -- | -- | 112PCPC | 2.9m | 02-08-52 | -- | -- | -- | -- | H,S | SO Bf 11 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Bf 12 |
| 200 | 2 | 220 | 122MNKN | 17 | 09-13-77 | 7 | 10 | 2 | 1.4 | T | SO Bf 13 |
| +1 - 85 | | | | 20 | | 10 | 70 | 2 | 7.0 | H | SO Bf 14 |
| 85 -205 | 3 | 205 -245 | 122MNKN | 25.0m | 04-14-87 | | | | | | |
| 240 | 2 | 250 | 122MNKN | 30 | 01-28-77 | 30 | 20 | 4 | .67 | H | SO Bf 15 |
| | | | | 33.2m | 04-14-87 | | | | | | |
| 220 | 4 | 240 | 122MNKN | 22 | 07-10-79 | 7 | 20 | 1 | 2.9 | H | SO Bf 16 |
| | | | | 26.8m | 04-14-87 | | | | | | |
| +1 -120 | | | | 25 | 05-03-85 | 5 | 30 | 2 | 6.0 | I | SO Bf 17 |
| 120 -200 | 3 | 200 -230 | 122MNKN | | | | | | | | |
| +1 - 80 | | | | 20 | 02-28-83 | 2 | 30 | 3 | 15 | H | SO Bf 18 |
| 80 -175 | 3 | 175 -200 | 122MNKN | 21.6m | 04-15-87 | | | | | | |
| 190 | 2 | 210 | 122MNKN | 35 | 07-25-79 | 115 | 100 | 2 | .87 | H | SO Bf 19 |
| | | | | 31.5m | 04-14-87 | | | | | | |
| 20 | 4 | 30 | 112PCPC | 12 | 07-16-70 | 13 | 30 | 1 | 2.3 | I | SO Bf 20 |
| 7 | 2 | 12 | 112PCPC | 2.6 | 04-15-87 | -- | -- | -- | -- | U | SO Bf 21 |
| 205 | 2 | 230 | 122MNKN | 30 | 08-27-86 | 3 | 60 | 1 | 20 | H | SO Bf 22 |
| 215 | 2 | 240 | 122MNKN | 22 | 04-18-86 | 1 | 65 | 1 | 65 | S | SO Bf 23 |
| 168 | 2 | 178 | 122MNKN | 20 | 05-08-86 | 4 | 15 | 2 | 3.8 | H | SO Bf 24 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; f = flowing well; SWD = Somerset Well Drilling; SP&W = Sydnor Pump and Well]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Bf 25 | SO-81-0922 | FORD, GREGORY | SWD | 07-10-86 | 43 | 235 | 2 |
| SO Bg 1 | -- | ALDER, G | BEAUCHAMP | 00-00-48 | 30 | 14.8 | 1.5 |
| SO Bg 2 | -- | BROWN, H | -- | 00-00-52 | 25 | -- | -- |
| SO Bg 3 | SO-73-1390 | GRUY FEDERAL INC | GLASCOCK | 11-14-78 | 30 | 1,050 | 4.5 |
| SO Bg 4 | SO-81-0016 | PERRY HAWKIN CHRIST CHURCH | SWD | 11-06-81 | 20 | 275 | 2 |
| SO Bg 5 | SO-81-0963 | BEAUCHAMP, ROYCE | SWD | 09-03-86 | 25 | 260 | 2 |
| SO Ca 1 | SO-00-8350 | BERWICK DEVELOPMENT CO | CUSICK | 10-15-51 | 5 | 871 | 1.5<br>1 |
| SO Cb 1 | SO-00-6230 | BRITTINGHAM, BOYD | CUSICK | 07-08-50 | 5 | 157 | 1.5 |
| SO Cb 2 | SO-00-6338 | THOMAS, WILLIAM C | CUSICK | 07-26-50 | 5 | 142 | 1.5 |
| SO Cb 3 | SO-00-1893 | WEBSTER, JOHN W | CUSICK | 11-25-47 | 5 | 142 | 1.5 |
| SO Cb 4 | SO-00-0905 | JOHN BENNETT & PARTNERS | TODD | 10-25-46 | 5 | 693 | 1.5 |
| SO Cb 5 | SO-00-0586 | HARRISON, STANFORD | CUSICK | 12-05-46 | 5 | 140 | 1.5 |
| SO Cb 6 | | WILSON SEAFOOD CO | ROBBINS | 00-00-15 | 5 | 500-700(?) | 4 |
| SO Cb 7 | -- | BRITTINGHAM, BOYD | CUSICK | 00-00-50 | 5 | 140 | 1.5 |
| SO Cb 8 | -- | DANIELS, MR | -- | 00-00-42 | 5 | 23 | 1.5 |
| SO Cb 9 | -- | WHITE, STANFORD | -- | 00-00-45 | 5 | 23 | 1.5 |
| SO Cb 10 | -- | WHITE, MR | -- | 00-00-47 | 5 | 23 | 1.5 |
| SO Cb 11 | -- | JONES, ROBERT S | -- | 00-00-49 | 10 | 19 | 1.25 |
| SO Cb 12 | -- | WALTERS, ADOLPHUS | -- | 00-00-52 | 5 | 7.5 | 1.5 |
| SO Cb 13 | -- | ABBOTT, OSCAR | CUSICK | 00-00-43 | 5 | 145 | 1.5 |
| SO Cb 14 | -- | BAKER, WALTER | -- | 00-00-45 | 5 | 8 | 1.5 |
| SO Cb 15 | -- | SOMERSET CO. BOARD OF ED | WHITE | 09-00-53 | 5 | 147 | 3<br>2 |
| SO Cb 16 | -- | J. H. BURTON & SONS | -- | 00-00-34 | 5 | 313 | -- |
| SO Cb 17 | -- | EDWARDS HENRY S | OWNER | 05-30-80 | 6 | 21.4 | 3 |
| SO Cb 18 | SO-73-0784 | FAITH SEAFOOD CO | FORD | 07-30-76 | 5 | 150 | 2 |
| SO Cb 19 | SO-70-0040 | ST. JAMES AME CHURCH | FORD | 11-07-69 | 5 | 142 | 2 |
| SO Cb 20 | SO-73-1326 | SOMERSET CO. BOARD OF ED | WALLACE | 08-04-78 | 10 | 161 | 6 |
| SO Cb 21 | SO-65-0070 | SUTTER, EVERETT C | MARSHALL | 03-17-65 | 10 | 135 | 3<br>2 |
| SO Cb 22 | SO-68-0103 | WEBSTER, ROY | MARSHALL | 07-28-68 | 10 | 135 | 2 |
| SO Cb 23 | SO-68-0101 | SOMERSET CO. BOARD OF ED | FORD | 09-25-68 | 10 | 144 | 2 |
| SO Cb 24 | SO-81-0040 | COLLIER, CHUCK | HALL | 03-15-82 | 10 | 140 | 2 |
| SO Cb 25 | SO-81-0901 | HORNER, FRANK | HALL | 07-17-86 | 5 | 140 | 2 |
| SO Cb 26 | SO-81-0763 | EDWARDS, HENRY | HALL | 12-12-85 | 5 | 140 | 2 |
| SO Cb 27 | SO-81-0755 | WALTERS, CLYDE | HALL | 11-13-85 | 5 | 140 | 2 |
| SO Cc 1 | SO-00-0849 | WHALEY, T B | WHITE | 04-10-52 | 5 | 840 | 3<br>2<br>1.25 |
| SO Cc 2 | -- | HOLLAND, AUBREY | REVEL | 00-00-46 | 5 | 8 | 36 |
| SO Cc 3 | -- | MEREDITH, CALVERT MRS | -- | 00-00-40 | 5 | 8 | 36 |
| SO Cc 4 | -- | U.S. GEOLOGICAL SURVEY | DEL GEO SURV | 11-18-52 | 5 | 95 | 4 |
| SO Cc 5 | SO-68-0040 | RUMBLEY-FRENCHTOWN WATER CO | SP&W | 03-25-68 | -- | 1,084 | 6<br>4<br>4<br>4<br>4 |
| SO Cc 6 | SO-68-0041 | RUMBLEY-FRENCHTOWN WATER CO | SP&W | 05-27-68 | 5 | 1,090 | 8<br>6<br>6<br>6<br>6 |
| SO Cc 7 | SO-70-0043 | DYKES, ROBERT E | KANARR | 03-13-70 | 5 | 1,140 | 4<br>2<br>2 |
| SO Cd 1 | SO-00-6983 | BLOODSWORTH, BEAUCHAMP | WHITE | 11-00-50 | 5 | 151 | 2 |
| SO Cd 2 | SO-00-8346 | KAUFFMAN, CAPT F.B. | WHITE | 09-00-51 | 5 | 166 | 2 |
| SO Cd 3 | SO-00-1535 | CHRISTENSEN, KOREN | FARLOW | 06-14-47 | 5 | 150 | 2<br>-- |
| SO Cd 4 | SO-00-8351 | BAUGHER, MARGARET | CUSICK | 08-01-51 | 10 | 193 | 1.5 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 210 | 2 | 235 | 122MNKN | 28 | 07-10-86 | 2 | 60 | 1 | 30 | H | SO Bf 25 |
| -- | -- | -- | 112PCPC | 2.6m | 02-08-52 | -- | -- | -- | -- | H | SO Bg 1 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Bg 2 |
| 1,039 | -- | -- | 124PNPN | -- | -- | -- | -- | -- | -- | U | SO Bg 3 |
| 245 | 2 | 275 | 122MNKN | 10 | 11-06-81 | 2 | 10 | 1 | 5.0 | T | SO Bg 4 |
| 230 | 2 | 260 | 122MNKN | 16 | 09-03-86 | 1 | 60 | 1 | 60 | H | SO Bg 5 |
| 0 - 540 | | | | -- | -- | -- | 10 | -- | -- | C | SO Ca 1 |
| 540 - 865 | -- | -- | 217PTMC | | | | | | | | |
| 137 | -- | 157 | 122MNKN | 3 | 07-08-50 | 8 | 8 | 4 | 1.0 | H | SO Cb 1 |
| 122 | -- | 142 | 122MNKN | 2 | 07-26-50 | 2 | 15 | 4 | 7.5 | H | SO Cb 2 |
| 132 | -- | 142 | 122MNKN | 4 | 11-25-47 | 3 | 30 | 1 | 10 | C,H | SO Cb 3 |
| 693 | -- | -- | 124PNPN | 8 | 10-25-46 | -- | 10 | 8 | -- | C,H | SO Cb 4 |
| 120 | -- | 140 | 122MNKN | 4 | 12-05-46 | 2 | 25 | 2 | 3 | C,H | SO Cb 5 |
| -- | -- | -- | 124PNPN | -- | -- | -- | -- | -- | -- | C | SO Cb 6 |
| 120 | -- | 140 | 122MNKN | -- | -- | -- | -- | -- | -- | C | SO Cb 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cb 8 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cb 9 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cb 10 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cb 11 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cb 12 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Cb 13 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cb 14 |
| 0 - 42 | | | | 3 | 09-00-53 | -- | 12 | 4 | -- | T | SO Cb 15 |
| 0 - 133 | 2 | 133 - 147 | 122MNKN | | | | | | | | |
| -- | -- | -- | 122CPNK | -- | -- | -- | -- | -- | -- | U | SO Cb 16 |
| 18 | 3 | 21.4 | 112PCPC | 5.1m | 05-30-80 | -- | -- | -- | -- | C | SO Cb 17 |
| 130 | 2 | 150 | 122MNKN | 6 | 07-30-76 | 1 | 15 | 2 | 15 | C | SO Cb 18 |
| | | | | 4.5m | 04-16-87 | | | | | | |
| 130 | -- | 142 | 122MNKN | 6 | 11-07-69 | 3 | 10 | 2 | 3.3 | T | SO Cb 19 |
| 117 | 6 | 138 | 122MNKN | 8 | 08-04-78 | 16 | 20 | 3 | 1.3 | N | SO Cb 20 |
| +1 - 42 | | | | -- | -- | -- | 18 | 2 | -- | C | SO Cb 21 |
| +1 - 129 | 2 | 129 - 135 | 122MNKN | | | | | | | | |
| 129 | 2 | 135 | 122MNKN | 12 | 07-28-68 | 10 | 9 | 1 | .90 | C | SO Cb 22 |
| 124 | 2 | 144 | 122MNKN | 8 | 09-25-68 | -- | 10 | 2 | -- | Z | SO Cb 23 |
| 120 | 2 | 140 | 122MNKN | 10 | 03-15-82 | 3 | 9 | 1.5 | 3.0 | H | SO Cb 24 |
| 120 | 2 | 140 | 122MNKN | 7 | 07-17-86 | 3 | 50 | 1 | 17 | H | SO Cb 25 |
| 120 | 2 | 140 | 122MNKN | 8 | 12-12-85 | -- | -- | -- | -- | H | SO Cb 26 |
| 120 | 2 | 140 | 122MNKN | 5 | 11-13-85 | 1 | 40 | 1 | 40 | H | SO Cb 27 |
| +2 - 107 | | | | +5 | 04-10-52 | -- | 4 | -- | -- | H | SO Cc 1 |
| +1.5- 588 | | | | | | | | | | | |
| 510 - 720 | 1.25 | 720 - 740 | 124PNPN | | | | | | | | |
| 8 | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cc 2 |
| 8 | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cc 3 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | U | SO Cc 4 |
| +1.6- 202 | | | | +10.5m | 05-03-68 | -- | 100 | 12 | -- | P | SO Cc 5 |
| 202 -1,038 | 4 | 1,038 -1,043 | 217PTMC | | | | | | | | |
| 1,043 -1,058 | 4 | 1,058 -1,063 | 217PTMC | | | | | | | | |
| 1,063 -1,068 | 4 | 1,068 -1,078 | 217PTMC | | | | | | | | |
| 1,078 -1,084 | | | | | | | | | | | |
| +1.5- 209 | | | | +1.5f | 05-27-68 | -- | 200 | 12 | -- | P | SO Cc 6 |
| 209 -1,021 | 6 | 1,021 -1,028 | 217PTMC | | | | | | | | |
| 1,026 -1,052 | 6 | 1,052 -1,057 | 217PTMC | | | | | | | | |
| 1,057 -1,073 | 6 | 1,073 -1,078 | 217PTMC | | | | | | | | |
| 1,078 -1,083 | | | | | | | | | | | |
| +2 -1,035 | 4 | 1,035 -1,050 | 217PTMC | +8 | 03-09-70 | 138 | 30 | 2 | .22 | C | SO Cc 7 |
| | 2 | 1,045 -1,055 | 217PTMC | 3.2m | 04-15-87 | | | | | | |
| 1,055 -1,114 | 2 | 1,114 -1,128 | 217PTMC | | | | | | | | |
| 1,128 -1,140 | | | | | | | | | | | |
| 141 | 2 | 151 | 122MNKN | +1 | 11-00-50 | -- | 12 | 4 | -- | H,S | SO Cd 1 |
| 156 | 2 | 166 | 122MNKN | 1.5 | 09-00-51 | -- | 12 | 6 | -- | H,S | SO Cd 2 |
| 140.5 | -- | 140.5- 148.5 | 122MNKN | +1 | 06-14-47 | -- | 30 | 2 | -- | H | SO Cd 3 |
| 148.5- 150 | | | | | | | | | | | |
| 183 | -- | 193 | 122MNKN | 0 | 08-01-51 | 1 | 30 | 2 | 30 | H,S | SO Cd 4 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gsl/min = gsllons per minuts; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = sbove lsnd surfsce; f = flowing well; SWD = Somersst Well Drilling]

| Local well no. | Permit number | Owner | Contrsctor | Dste well con-structed | Alti-tude of lsnd sur-fscs (ft) | Depth drilled (ft) | Diam-etsr of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Cd 5 | -- | WALSTON, ARZIE | -- | -- | 5 | 21 | 1.25 |
| SO Cd 6 | -- | WILSON, EVELYN | -- | 00-00-40 | 5 | 8 | 36 |
| SO Cd 7 | -- | STEVENSON, ETHEL MRS | -- | 00-00-27 | 5 | 30 | 1.5 |
| SO Cd 8 | -- | SLAGLE, ELMER F | -- | 00-00-47 | 5 | 20 | 1.5 |
| SO Cd 9 | -- | SOMERSET CO. BOARD OF ED | WHEATLEY | 00-00-36 | 5 | 350 | 2 |
| SO Cd 10 | -- | ROSS, E P | -- | 1875 | 5 | 25 | 36 |
| SO Cd 11 | -- | FAIRMOUNT PARSONAGE | -- | 00-00-02 | 5 | 25 | 36 |
| SO Cd 12 | -- | DAVIS, ELWOOD | DAVIS | 00-00-50 | 5 | 60 | 1.5 |
| SO Cd 13 | -- | WATERS, CARRIE | WATERS | 00-00-15 | 5 | 25 | 1.5 |
| SO Cd 14 | -- | MCLEAN, WILLIAM | -- | 00-00-40 | 5 | 18 | 1.5 |
| SO Cd 15 | -- | MCLEAN, WILLIAM | -- | 00-00-12 | 5 | 20 | 24 |
| SO Cd 16 | -- | WARWICK, JAMES | -- | 1890 | 5 | 169 | 2 |
| SO Cd 17 | -- | CARPENTER, EDWARD | -- | 00-00-39 | 20 | 92 | 2 |
| SO Cd 18 | -- | CARPENTER, EDWARD | -- | -- | 20 | 15.7 | 36 |
| SO Cd 19 | -- | CARPENTER, EDWARD | ENNIS BROS | 10-00-44 | 20 | 196 | 6 |
| SO Cd 20 | -- | CARPENTER, EDWARD | ENNIS BROS | 03-25-41 | 20 | 200 | 4<br>2.5 |
| SO Cd 21 | -- | LONG, M T | -- | 00-00-12 | 10 | 20 | 1.25 |
| SO Cd 22 | -- | REICHARD, CHAS | -- | 00-00-35 | 15 | 15 | 1.75 |
| SO Cd 23 | -- | REICHARD, CHAS | -- | 00-00-38 | 15 | 15 | 1.75 |
| SO Cd 24 | -- | BEECHUM, ROBT | -- | 10-00-12 | 5 | 20 | 1.5 |
| SO Cd 25 | -- | JONES, ROY | -- | 00-00-37 | 5 | 21 | 1.25 |
| SO Cd 26 | -- | GROVER, WM M | -- | 00-00-47 | 20 | 15 | 2 |
| SO Cd 27 | -- | GROVER, WM M | -- | 00-00-47 | 20 | 15 | 2 |
| SO Cd 28 | -- | GROVER, WM M | -- | 00-00-47 | 20 | 15 | 2 |
| SO Cd 29 | -- | FONTAINE, CHAS MRS | CUSICK | 00-00-51 | 10 | 190 | 1.5 |
| SO Cd 30 | -- | FONTAINE, W W | FONTAINE | 00-00-40 | 10 | 15 | 1.5 |
| SO Cd 31 | -- | JOYNES, J P | JOYNES | 00-00-40 | 5 | 15 | 1.25 |
| SO Cd 32 | -- | JOYNES, GEORGE R | JOYNES | 00-00-49 | 5 | 19 | 1.25 |
| SO Cd 33 | -- | GREEN, SAMUEL | GREEN | 00-00-42 | 5 | 20 | 1.5 |
| SO Cd 34 | -- | ROBINSON, MARGARET | -- | 00-00-43 | 5 | 15 | 1.25 |
| SO Cd 35 | -- | MADDOX, RANDOLPH | -- | 04-17-52 | 5 | 4.5 | 24 |
| SO Cd 36 | -- | BOARD, CHESTER P | -- | 1877 | 10 | 7.6 | 24 |
| SO Cd 37 | -- | RUARK, GARLAND | RUARK | 00-00-50 | 10 | 90 | 1.5 |
| SO Cd 38 | -- | MAALOE, F W | MAALOE | 00-00-27 | 5 | 23 | 1.5 |
| SO Cd 39 | -- | HAYMAN, E G | WHEATLEY | 00-00-37 | 5 | 160 | -- |
| SO Cd 41 | SO-73-1425 | SOMERSET CO. SANITARY COMM | DELMARVA DRLNG | 03-21-79 | 5 | 1,145 | 8 |
| SO Cd 42 | SO-70-0052 | BOZMAN, HAROLD | FORD | 12-11-69 | 10 | 53 | 3<br>2 |
| SO Cd 43 | SO-73-0661 | BOZMAN, HAROLD | FORD | 04-01-76 | 10 | 55 | 2 |
| SO Cd 44 | SO-81-0252 | SAMUEL WESLEY UM CH | SWD | 06-01-83 | 10 | 50 | 2 |
| SO Cd 45 | SO-73-1738 | WHITE, TOM | KAUFFMAN | 07-16-80 | 5 | 70 | 4 |
| SO Cd 46 | SO-73-1742 | WHITE, TOM | KAUFFMAN | 07-18-80 | 5 | 155 | 4 |
| SO Cd 47 | SO-73-1737 | WHITE, TOM | KAUFFMAN | 07-16-80 | 5 | 70 | 4 |
| SO Cd 48 | SO-73-0563 | BLOODSWORTH, DOUGLAS | DASHIELL | 09-22-75 | 5 | 160 | 2 |
| SO Cd 49 | SO-81-0800 | MONICK, STEPHEN | SWD | 03-07-86 | 5 | 165 | 4 |
| SO Cd 50 | SO-81-0086 | AINSWORTH, FREEDOM H | SWD | 07-03-82 | 5 | 162 | 4<br>3 |
| SO Cd 51 | SO-73-0529 | CARPENTER, MURTON D | FORD | 02-05-76 | 20 | 200 | 4 |
| SO Cd 52 | -- | FORD, CECIL | -- | -- | 5 | 57 | -- |
| SO Cd 53 | SO-81-0840 | WALLER, DAVID LEE | DASHIELL DRLNG | 04-18-86 | 5 | 180 | 2 |
| SO Cd 54 | SO-81-0824 | SCHERBACK, JOHN | HALL | 06-14-86 | 5 | 160 | 2 |
| SO Ce 1 | SO-00-0164 | DUNCAN, C K | WHITE | 05-02-46 | 10 | 78 | 3<br>2<br>2 |
| SO Ce 2 | SO-00-3479 | DORSEY, THOMAS | CUSICK | 12-31-48 | 15 | 246 | 1.5 |
| SO Ce 3 | SO-00-4145 | BROSEY, WALTER W | CUSICK | 06-28-48 | 15 | 228 | 1.5 |
| SO Ca 4 | SO-00-8871 | CATLIN, LUTHER F, JR | CUSICK | 10-31-51 | 10 | 225 | 1.5 |
| SO Cs 5 | SO-00-5741 | RICHARDS, J R | CUSICK | 05-11-50 | 10 | 240 | 1.5 |
| SO Ce 6 | SO-00-0944 | MASSEY, HAROLD E | CUSICK | 11-20-46 | 10 | 90 | 2 |

| Bottom of casing or cssad inter-vsl (ft) | Diam-ater of screen (in.) | Bottom of screen or screened inter-val (ft) | Aquifer coda | Water level (ft) | Date water level meaa-ured | Draw-down (ft) | Dia-charge (gal/ min) | Pumping pariod (hours) | Spa-cific caps-city [(gal/ min)/ ft] | Use of watar | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 8 |
| -- | -- | -- | 122CPNK | +1f | 06-00-44 | -- | -- | -- | -- | U | SO Cd 9 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 10 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 11 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H | SO Cd 12 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 13 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 14 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 15 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Cd 16 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H,S | SO Cd 17 |
| -- | -- | -- | 112PCPC | 7.7m | 02-06-52 | -- | -- | -- | -- | H,S | SO Cd 18 |
| 170 | 4 | 196 | 122MNKN | 18 | 10-00-44 | -- | -- | -- | -- | H,S | SO Cd 19 |
| 0 - 170 | -- | | | -- | -- | -- | -- | -- | -- | H,S | SO Cd 20 |
| 170 - 183 | | 183 - 193 | 122MNKN | | | | | | | | |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 21 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 22 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | S | SO Cd 23 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 24 |
| -- | -- | -- | 112PCPC | .5 | 02-16-52 | -- | -- | -- | -- | H,S | SO Cd 25 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 26 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 27 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cd 28 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Cd 29 |
| -- | -- | -- | 112PCPC | 5 | 04-17-52 | -- | -- | -- | -- | S | SO Cd 30 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 31 |
| 15 | -- | 19 | 112PCPC | 0 | 00-00-49 | -- | -- | -- | -- | H | SO Cd 32 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 33 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 34 |
| -- | -- | -- | 112PCPC | 1.9m | 04-17-52 | -- | -- | -- | -- | H | SO Cd 35 |
| -- | -- | -- | 112PCPC | 3.7m | 04-17-52 | -- | -- | -- | -- | H | SO Cd 36 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H | SO Cd 37 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cd 38 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Cd 39 |
| 1,110 | 6 | 1,140 | 217PTMC | +7.8 | 05-28-79 | 99.4 | 100 | 26 | 1.0 | P | SO Cd 41 |
| 0 - 21 | | | | -- | -- | -- | 15 | 2 | -- | C | SO Cd 42 |
| +2 - 45 | 2 | 45 - 53 | 122PCMK | | | | | | | | |
| 40 | 2 | 55 | 122PCMK | 5 | 04-01-76 | 1 | 10 | 2 | 10 | C | SO Cd 43 |
| 40 | 2 | 50 | 122PCMK | 7 | 06-01-83 | 3 | 15 | 1 | 5.0 | T | SO Cd 44 |
| 35 | 4 | 65 | 122PCMK | 4.5 | 07-16-80 | 7 | 60 | 2.5 | 8.6 | I | SO Cd 45 |
| | | | | 2.0m | 04-15-87 | | | | | | |
| 100 | 4 | 155 | 122MNKN | 12.2 | 07-18-80 | 5.8 | 40 | 3 | 6.9 | I | SO Cd 46 |
| 37 | 4 | 67 | 122PCMK | 9 | 07-16-80 | 9 | 60 | 2.5 | 6.7 | I | SO Cd 47 |
| 152 | 2 | 160 | 122MNKN | 20 | 09-22-75 | 7 | 15 | 1 | 2.1 | C,H | SO Cd 48 |
| 145 | 4 | 165 | 122MNKN | 10 | 03-07-86 | 1 | 50 | 1 | 50 | H | SO Cd 49 |
| | | | | 9.0m | 04-14-87 | | | | | | |
| +1 - 87 | | | | 7 | 03-07-82 | 3 | 40 | 1 | 13 | N | SO Cd 50 |
| 87 - 142 | 3 | 142 - 162 | 122MNKN | 9.2m | 04-14-87 | | | | | | |
| 180 | 4 | 200 | 122MNKN | 9 | 02-05-76 | 18 | 25 | 2 | 1.4 | I | SO Cd 51 |
| | | | | 19.7m | 04-14-87 | | | | | | |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | - | SO Cd 52 |
| 170 | 2 | 180 | 122MNKN | 16 | 04-18-86 | 7 | 16 | 1 | 2.3 | H | SO Cd 53 |
| 140 | 2 | 160 | 122MNKN | 9 | 06-14-86 | 1 | 47 | 1 | 47 | H | SO Cd 54 |
| 0 - 63 | | | | 4 | 05-02-46 | -- | 40 | 2 | -- | C | SO Ce 1 |
| 0 - 68.5 | 2 | 68.5- 76.5 | 122PCMK | | | | | | | | |
| 76.5- 78 | | | | | | | | | | | |
| 228 | 1.5 | 246 | 122MNKN | 2 | 12-31-48 | 4 | 22 | 2 | 5.5 | H | SO Ce 2 |
| 213 | 1.5 | 228 | 122MNKN | 3 | 06-28-48 | 4 | 15 | 3 | 3.8 | H,S | SO Ce 3 |
| 210 | 1.5 | 225 | 122MNKN | 3 | 10-31-51 | 1.5 | 30 | 2 | 20 | H | SO Ce 4 |
| 225 | 1.5 | 240 | 122MNKN | 2 | 05-11-50 | 2 | 24 | 2 | 12 | H | SO Ce 5 |
| 78 | 2 | 90 | 122PCMK | 3 | 11-20-46 | 1 | 30 | 3 | 30 | S | SO Ce 6 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no date; m = measured; + = above land surface; f = flowing; SAW = Shannahan Art. Well; SWD = Somerset Well Drilling]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Ce 7 | SO-00-3435 | WIDDOWSON, N D | WHITE | 12-21-48 | 10 | 198.5 | 2 |
| SO Ce 8 | SO-00-1020 | CHAMBERLIN, JOHN A | CUSICK | 12-24-46 | 15 | 235 | 1.5 |
| SO Ce 9 | SO-00-1019 | JAMES, WM T, JR | CUSICK | 12-28-46 | 15 | 238 | 1.5 |
| SO Ce 10 | SO-00-4272 | RUARK, DONALD M | CUSICK | 07-21-49 | 15 | 222 | 1.5 |
| SO Ce 11 | SO-00-3618 | MCDORMAN, ROBERT H | WHITE | 09-00-49 | 10 | 192 | 2 |
| SO Ce 12 | SO-00-2002 | BLEVINS, SOMERS | CUSICK | 11-19-47 | 10 | 210 | 1.5 |
| SO Ce 13 | SO-00-2433 | LONG, DENET | CUSICK | 04-21-48 | 15 | 237 | 1.5 |
| SO Ce 14 | SO-00-1105 | LONG BROS | CUSICK | 08-22-47 | 15 | 233 | 2.5 |
| SO Ce 15 | SO-00-1102 | RING, ROY J | CUSICK | 09-27-47 | 10 | 190 | 1.5 |
| SO Ce 16 | -- | JOYNES, J F | WHITE | 00-00-47 | 10 | 190 | 2 |
| SO Ce 17 | -- | RICHARDSON, PHILLIP | -- | 00-00-47 | 10 | 18 | 1.5 |
| SO Ce 18 | -- | MULCAHY, D J | -- | 00-00-51 | 15 | 20 | 1.5 |
| SO Ce 19 | -- | WHITE, WILLIAM MRS | -- | 00-00-50 | 15 | 40 | 1.5 |
| SO Ce 20 | -- | -- | -- | -- | 5 | -- | -- |
| SO Ce 21 | -- | SUMMER LABOR CAMP | KOHL BROS | 00-00-34 | 10 | 190 | 6 |
| SO Ce 22 | -- | THOMPSON, FRANCES | TAYLOR | 00-00-51 | 15 | 100 | 1.5 |
| SO Ce 23 | -- | BRUIN, ELLA | -- | 00-00-49 | 15 | 25 | 1.5 |
| SO Ce 24 | -- | -- | -- | -- | 15 | 19.7 | 1.5 |
| SO Ce 25 | -- | COLLINS, DAVID | -- | 00-00-42 | 15 | 18 | 1.25 |
| SO Ce 26 | -- | WHITE, ISAAC | -- | 00-00-46 | 15 | 20 | 1.25 |
| SO Ce 27 | -- | SIGRIST, JOE | -- | 08-00-48 | 20 | 25 | 1.25 |
| SO Ce 28 | -- | DORSEY, WALTER | -- | 00-00-47 | 20 | 25 | 1.5 |
| SO Ce 29 | -- | -- | -- | -- | 5 | 39.1 | 1.25 |
| SO Ce 30 | -- | MCLENDON, COL E L | -- | 1795 | 5 | 9.4 | 24 |
| SO Ce 31 | -- | RUE, WILLIAM | -- | -- | 10 | 24 | 1.25 |
| SO Ce 32 | -- | WILLIAMS, GEO | WILLIAMS | 00-00-51 | 10 | 30 | 1.25 |
| SO Ce 33 | -- | FORD, WILLIAM | -- | 00-00-42 | 15 | 24 | 1.25 |
| SO Ce 34 | -- | POOLE, CHARLIE MRS | -- | 00-00-40 | 15 | 41.2 | 1.25 |
| SO Ce 35 | -- | -- | -- | -- | 15 | 11.1 | 1.25 |
| SO Ce 36 | -- | HUFFMAN, D F | HUFFMAN | 00-00-46 | 15 | 32 | 1.25 |
| SO Ce 37 | -- | PERRY, W W | CUSTIS | 00-00-17 | 5 | 190 | 3 |
| SO Ce 38 | -- | KEENAN, HARRY | SCOTT | 00-00-50 | 5 | 226.5 | 2 |
| SO Ce 39 | SO-01-0638 | BARNES, G HOWETH | CUSICK | 08-27-52 | 20 | 232 | 1.5 |
| SO Ce 41 | SO-81-0390 | EASTERN CORRECTIONAL INST | SAW | 06-11-84 | 10 | 254 | 4 |
| SO Ce 42 | SO-81-0394 | EASTERN CORRECTIONAL INST | SAW | 06-15-84 | 15 | 215 | 4 |
| SO Ce 43 | SO-81-0393 | EASTERN CORRECTIONAL INST | SAW | 06-19-84 | 20 | 246 | 2 |
| SO Ce 44 | SO-81-0556 | EASTERN CORRECTIONAL INST | LAYNE ATLNTC | 03-22-85 | 10 | 250 | 10 |
| SO Ce 45 | SO-81-0389 | EASTERN CORRECTIONAL INST | SAW | 06-12-84 | 10 | 227 | 2 |
| SO Ce 46 | SO-81-0391 | EASTERN CORRECTIONAL INST | SAW | 06-13-84 | 10 | 218 | 2 |
| SO Ce 47 | SO-81-0435 | EASTERN CORRECTIONAL INST | SAW | 06-28-84 | 10 | 229 | 2 |
| SO Ce 48 | SO-81-0557 | EASTERN CORRECTIONAL INST | LAYNE ATLNTC | 04-09-85 | 10 | 235 | 10 |
| SO Ce 49 | SO-81-0433 | EASTERN CORRECTIONAL INST | SAW | 07-03-84 | 10 | 244 | 6 |
| SO Ce 50 | SO-81-0454 | EASTERN CORRECTIONAL INST | SAW | 07-05-84 | 10 | 222 | 2 |
| SO Ce 51 | SO-81-0434 | EASTERN CORRECTIONAL INST | SAW | 06-29-84 | 10 | 240 | 2 |
| SO Ce 52 | SO-81-0392 | EASTERN CORRECTIONAL INST | SAW | 06-15-84 | 10 | 205 | 2 |
| SO Ce 53 | SO-73-1252 | SOMERSET CO. TOURIST COMM | SWD | 06-30-78 | 15 | 220 | 2 |
| SO Ce 54 | SO-73-0633 | U.S. POSTAL SERVICE | FORD | 04-28-76 | 20 | 50 | 2 |
| SO Ce 55 | SO-73-0490 | ENGLISH'S GRILL | DASHIELL DRLNG | 05-29-75 | 20 | 230 | 2 |
| SO Ce 56 | SO-81-0733 | SOMERSET WELL DRLG. CO. | SWD | 12-20-85 | 10 | 230 | 4 |
| SO Ce 57 | SO-81-0120 | KATO INC | SWD | 07-30-82 | 20 | 240 | 2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 182.5 | 2 | 198.5 | 122MNKN | 4 | 12-21-48 | -- | 15 | 3 | -- | H,S | SO Ce 7 |
| 220 | 1.5 | 235 | 122MNKN | 4 | 12-24-46 | 1.5 | 30 | 3 | 20 | H | SO Ce 8 |
| 223 | 1.5 | 238 | 122MNKN | 4 | 12-28-46 | 1.5 | 25 | 3 | 17 | H | SO Ce 9 |
| 207 | 1.5 | 222 | 122MNKN | 1.5 | 07-21-49 | 4.5 | 24 | 3 | 5.3 | H,S | SO Ce 10 |
| 179 | 2 | 191 | 122MNKN | 1 | 09-00-49 | -- | 15 | 3 | -- | H,S | SO Ce 11 |
| 195 | 1.5 | 210 | 122MNKN | 1 | 11-19-47 | 3 | 20 | 2 | 6.7 | H,S | SO Ce 12 |
| 222 | 1.5 | 237 | 122MNKN | 4 | 04-21-48 | 4 | 30 | 16 | 7.5 | H | SO Ce 13 |
| 215 | 2.5 | 233 | 122MNKN | 3 | 08-22-47 | 3 | 50 | 3 | 17 | N | SO Ce 14 |
| 175 | 1.5 | 190 | 122MNKN | +.7 | 09-27-47 | 2.7 | 28 | 2 | 10 | H,S | SO Ce 15 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | H,S | SO Ce 16 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ce 17 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ce 18 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ce 19 |
| -- | -- | -- | 112PCPC | -- | -- | -- | 12 | -- | -- | P | SO Ce 20 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | P | SO Ce 21 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | C,H | SO Ce 22 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ce 23 |
| -- | -- | -- | 112PCPC | 4.1m | 04-14-52 | -- | -- | -- | -- | H,S | SO Ce 24 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ce 25 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ce 26 |
| 22 | -- | 25 | 112PCPC | -- | -- | -- | 4 | -- | -- | H | SO Ce 27 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ce 28 |
| -- | -- | -- | 122PCMK | 2.3m | 04-18-52 | -- | -- | -- | -- | U | SO Ce 29 |
| -- | -- | -- | 112PCPC | 4.9m | 04-18-52 | -- | -- | -- | -- | H | SO Ce 30 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ce 31 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ce 32 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ce 33 |
| -- | -- | -- | 122PCMK | 4.6m | 04-18-52 | -- | -- | -- | -- | H,S | SO Ce 34 |
| -- | -- | -- | 112PCPC | 2.1m | 04-18-52 | -- | -- | -- | -- | U | SO Ce 35 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H | SO Ce 36 |
| -- | -- | -- | 122MNKN | f | -- | -- | 4.5 | -- | -- | H,S | SO Ce 37 |
| 214.5 | 2 | 226.5 | 122MNKN | +.5 | 00-00-50 | -- | -- | -- | -- | H,S | SO Ce 38 |
| 217 | -- | 232 | 122MNKN | 6 | 08-29-52 | 4 | 25 | 2 | 6.3 | H | SO Ce 39 |
| 196 | 4 | 246 | 122MNKN | 24 | 06-11-84 | 38 | 70 | 41 | 1.8 | U | SO Ce 41 |
| | | | | 53.4m | 04-14-87 | | | | | | |
| 185 | 4 | 215 | 122MNKN | 21 | 06-15-84 | 142 | 45 | 29 | .32 | U | SO Ce 42 |
| | | | | 24.5m | 04-14-87 | | | | | | |
| 211 | 2 | 226 | 122MNKN | 25 | 06-19-84 | 15 | 17 | 1 | 1.1 | U | SO Ce 43 |
| | | | | 24.3m | 04-14-87 | | | | | | |
| 190 | 10 | 240 | 122MNKN | 24 | 03-22-85 | 119 | 125 | 48 | 1.1 | T | SO Ce 44 |
| | | | | 23.8 | 07-01-85 | 144 | 180 | 48 | 1.3 | | |
| 203 | 2 | 218 | 122MNKN | 26 | 06-12-84 | 9 | 15 | 1 | 1.7 | U | SO Ce 45 |
| | | | | 31.1m | 04-14-87 | | | | | | |
| 203 | 2 | 218 | 122MNKN | 26 | 06-13-84 | 8 | 17 | 1 | 2.1 | U | SO Ce 46 |
| | | | | 37.0m | 04-14-87 | | | | | | |
| 204 | 2 | 219 | 122MNKN | 25 | 06-28-84 | 26 | 19 | 1 | .73 | U | SO Ce 47 |
| | | | | 30.6m | 04-14-87 | | | | | | |
| 190 | 10 | 230 | 122MNKN | 22 | 04-09-85 | 124 | 180 | 48 | 1.5 | T | SO Ce 48 |
| | | | | 22 | 05-28-85 | 146 | 125 | 48 | .86 | | |
| 197 | 6 | 228 | 122MNKN | 24 | 07-03-84 | 155 | 152 | 72 | .98 | U | SO Ce 49 |
| | | | | 34.1m | 04-14-87 | | | | | | |
| 207 | 2 | 222 | 122MNKN | 22 | 07-05-84 | 25 | 20 | 1 | .80 | U | SO Ce 50 |
| | | | | 32.0m | 04-14-87 | | | | | | |
| 206 | 2 | 221 | 122MNKN | 25 | 06-29-84 | 25 | 20 | 1 | .80 | U | SO Ce 51 |
| | | | | 31.2m | 04-14-87 | | | | | | |
| 190 | 2 | 205 | 122MNKN | 24 | 06-15-84 | 41 | 19 | 1 | .46 | U | SO Ce 52 |
| | | | | 25.6m | 04-14-87 | | | | | | |
| 200 | 2 | 220 | 122MNKN | 8 | 06-30-78 | 2 | 10 | 1 | 5.0 | C | SO Ce 53 |
| 40 | 2 | 50 | 122PCMK | 5 | 04-28-76 | 1 | 10 | 3 | 10 | Z | SO Ce 54 |
| 220 | 2 | 230 | 122MNKN | 21 | 05-29-75 | 7 | 15 | 1 | 2.1 | C | SO Ce 55 |
| 140 | 3 | 230 | 122MNKN | 20 | 12-20-85 | 3 | 65 | 5 | 22 | C | SO Ce 56 |
| 210 | 2 | 240 | 122MNKN | 12 | 07-30-82 | 2 | 10 | 1 | 5.0 | C | SO Ce 57 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers, USGS = U.S. Geological Survey; CD&P = Coastal Drilling and Pump]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Ce 58 | SO-81-0166 | SOMERSET WELL DRILLING CO | SWD | 11-10-82 | 10 | 240 | 2 |
| SO Ce 59 | SO-73-1709 | RICHARD'S EXXON SERVICE | SWD | 06-30-80 | 20 | 240 | 2 |
| SO Ce 60 | SO-73-1079 | FORD, MARION | FORD | 10-01-77 | 10 | 100 | 2 |
| SO Ce 61 | SO-73-0091 | MD STATE HIGHWAY ADMIN. | KELLEY | 05-09-73 | 20 | 63 | 6 |
| SO Ce 62 | SO-73-0742 | FORD, MARION | FORD | 09-13-76 | 10 | 150 | 2 |
| SO Ce 63 | SO-73-0117 | LONG BROS. | FORD | 05-11-73 | 10 | 230 | 2 |
| SO Ce 64 | SO-73-0639 | SOMERSET CO. HEALTH CENTER | IWD | 03-20-76 | 10 | 128 | 6 |
| SO Ce 65 | SO-73-0796 | LONG BROS. | FORD | 08-02-76 | 10 | 240 | 2 |
| SO Ce 66 | SO-73-0725 | CRUSADE EVANGEL CHURCH | HALL | 05-18-76 | 20 | 20 | -- |
| SO Ce 67 | SO-65-0076 | LONG, EDWIN D | FORD | 03-23-65 | 10 | 231 | 3 |
| SO Ce 68 | SO-73-0402 | MAPLE GRILL | FORD | 12-27-74 | 20 | 230 | 2 |
| SO Ce 69 | SO-81-0159 | DELMARVA POWER & LIGHT | SWD | 10-14-82 | 10 | 240 | 4<br>3 |
| SO Ce 70 | SO-73-0638 | J MILLARD TAWES VOCAT'L SCH | IWD | 03-25-76 | 10 | 129 | 6 |
| SO Ce 71 | SO-69-0039 | DUNCAN, CLINTON K | IWD | 10-14-68 | 20 | 230 | 4 |
| SO Ce 72 | SO-71-0094 | ST. JAMES METHODIST CHURCH | FORD | 05-07-71 | 10 | 220 | 2 |
| SO Ce 73 | SO-67-0102 | DUNCAN, CLINTON K | FORD | 03-15-67 | 20 | 236 | 2 |
| SO Ce 74 | SO-73-0303 | LAKE SOMERSET CAMP | FORD | 09-04-74 | 20 | 250 | 2 |
| SO Ce 75 | -- | WISE, THOMAS | -- | -- | 20 | -- | -- |
| SO Ce 76 | SO-81-0092 | JEHOVAH'S WITNESSES | SWD | 07-01-82 | 20 | 240 | 2 |
| SO Ce 77 | SO-81-0374 | SCHROCK, RANDY | DELMARVA DRLNG | 03-23-84 | 20 | 120 | 4 |
| SO Ce 78 | SO-81-0555 | MILFORD FERTILIZER | SWD | 01-24-85 | 10 | 230 | 2 |
| SO Ce 79 | SO-73-1896 | HONEST BOB'S SMALL MALL | SWD | 04-23-81 | 20 | 240 | 2 |
| SO Ce 80 | SO-81-0498 | ST. ELIZABETH CATHOLIC CH | SWD | 09-12-84 | 10 | 230 | 2 |
| SO Ce 81 | SO-81-0036 | DARWENT, BASIL DR | CD&P | 03-30-82 | 10 | 80 | 4 |
| SO Ce 82 | SO-73-0181 | SOMERSET CO. BOARD OF ED | BUNDICK | 03-13-73 | 10 | 230 | 4 |
| SO Ce 83 | SO-73-1515 | GEORGE W. ENNIS' SONS | IWD | 06-14-79 | 20 | 30 | 2 |
| SO Ce 84 | SO-81-0597 | WIDDOWSON FARMS | SWD | 04-22-85 | 10 | 210 | 4<br>3 |
| SO Ce 85 | SO-81-0625 | PERDUE, INC | SYDNOR HYDRO | 08-16-85 | 20 | 240 | 6 |
| SO Ce 86 | SO-81-0624 | PERDUE, INC. | SYDNOR HYDRO | 08-16-85 | 20 | 260 | 6 |
| SO Ce 87 | SO-81-1014 | U.S. GEOLOGICAL SURVEY | USGS | 12-10-86 | 15 | 13 | 2 |
| SO Ce 88 | SO-81-1015 | U.S. GEOLOGICAL SURVEY | USGS | 01-05-87 | 5 | 12 | 2 |
| SO Ce 90 | SO-81-0679 | PUGH, WILLIE | SWD | 08-14-85 | 13 | 230 | 2 |
| SO Ce 92 | SO-73-1894 | NELSON, FREDERICK | SWD | 04-22-81 | 10 | 190 | 2 |
| SO Ce 94 | SO-81-0977 | HALL, MICHAEL | SWD | 10-02-86 | 8 | 183 | 4<br>2 |
| SO Cf 1 | SO-00-2038 | GREEN, FULTON | WHITE | 10-31-47 | 15 | 210 | 3<br>2<br>2 |
| SO Cf 2 | -- | MD STATE HIGHWAY ADMIN. | USGS | 08-16-49 | 20 | 15 | 1.25 |
| SO Cf 3 | SO-00-7353 | PAYNE, MAURICE | WHITE | 03-00-51 | 10 | 216 | 2 |
| SO Cf 4 | SO-00-2039 | BENSON, GEORGE | WHITE | 11-29-47 | 15 | 243 | 3<br>2<br>2 |
| SO Cf 5 | -- | PUSEY, W F | -- | 00-00-45 | 25 | 39 | 1.25 |
| SO Cf 6 | SO-00-1272 | WEIDEMA, WM | CUSICK | 06-24-47 | 20 | 256 | 1.5 |
| SO Cf 7 | -- | LONG, W H | -- | 00-00-42 | 20 | 19 | -- |
| SO Cf 8 | -- | MD GAME & INLAND FISH COMM | -- | 00-00-12 | 20 | 15.1 | 36 |
| SO Cf 9 | -- | COTMAN, LAURA MRS. | -- | 00-00-37 | 20 | 16 | 1.5 |
| SO Cf 10 | -- | BEAUCHAMP, T B | -- | 1852 | 20 | 23 | 1.25 |
| SO Cf 11 | -- | -- | -- | -- | 20 | 21.2 | 1.25 |
| SO Cf 12 | -- | TAYLOR, M V | -- | 00-00-49 | 20 | 22.5 | 1.25 |
| SO Cf 13 | -- | CREASY, FRED | -- | 00-00-40 | 20 | 35 | 1.5 |
| SO Cf 14 | SO-73-1291 | WOLFRAM PAUL | SWD | 07-29-78 | 22 | 90 | 2 |
| SO Cf 15 | SO-81-0276 | DEPT NAT RES WILDLIFE ADMIN | LARSON DRLNG | 07-28-83 | 20 | 244 | 2 |
| SO Cf 16 | SO-73-1635 | OLSEN'S FURNITURE | SWD | 12-28-79 | 20 | 240 | 2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Draw-down (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | 2 | 240 | 122MNKN | 18 | 11-10-82 | 4 | 30 | 2 | 7.5 | C | SO Ce 58 |
| 210 | 2 | 240 | 122MNKN | 10 | 06-30-80 | 3 | 10 | 2 | 3.3 | C | SO Ce 59 |
| 70 | 2 | 100 | 122PCMK | 7 | 10-01-77 | 1 | 10 | 3 | 10 | C | SO Ce 60 |
| | | | | 5.0m | 11-24-86 | | | | | | |
| 53 | 6 | 58 | 122PCMK | 2 | 05-09-73 | 10 | 60 | 3 | 6.0 | Z | SO Ce 61 |
| 125 | 2 | 150 | 122MNKN | 8 | 09-13-76 | 2 | 12 | 2 | 6.0 | C | SO Ce 62 |
| 214 | 2 | 230 | 122MNKN | 10 | 05-11-73 | 4 | 10 | 3 | 2.5 | C | SO Ce 63 |
| 121 | 6 | 127 | 122MOCN | 4 | 03-20-76 | 91 | 10 | 24 | .11 | Z | SO Ce 64 |
| | | | | 16.9m | 04-16-87 | | | | | | |
| 210 | 2 | 240 | 122MNKN | 10 | 08-02-76 | 2 | 20 | 2 | 10 | C | SO Ce 65 |
| | | | | 22.6m | 04-15-87 | | | | | | |
| 16 | -- | 20 | 112PCPC | 4 | 05-18-76 | 3 | 4 | 1 | 1.3 | T | SO Ce 66 |
| 84 | 2 | 231 | 122MNKN | 6 | 03-23-65 | -- | 14 | 2 | -- | C | SO Ce 67 |
| 210 | 2 | 230 | 122MNKN | 12 | 12-27-74 | 2 | 10 | 2 | 5.0 | C | SO Ce 68 |
| 105 | | | | 18 | 10-14-82 | 2 | 30 | 2 | 15 | C | SO Ce 69 |
| 210 | 3 | 240 | 122MNKN | | | | | | | | |
| 118 | 6 | 127 | 122PCMK | 4 | 03-25-76 | 91 | 20 | 24 | .22 | T | SO Ce 70 |
| 214 | 3 | 230 | 122MNKN | 18 | 10-14-68 | -- | 2 | 6 | -- | C | SO Ce 71 |
| 204 | -- | 220 | 122MNKN | 10 | 05-07-71 | 2 | 10 | 3 | 5.0 | T | SO Ce 72 |
| 216 | 2 | 236 | 122MNKN | 16 | 03-15-67 | -- | 10 | 2 | -- | C | SO Ce 73 |
| 220 | 2 | 250 | 122MNKN | 10 | 09-04-74 | 2 | 10 | 2 | 5.0 | P | SO Ce 74 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | C | SO Ce 75 |
| 220 | 2 | 240 | 122MNKN | 10 | 07-01-82 | 3 | 10 | 1.5 | 3.3 | T | SO Ce 76 |
| 30 | 4 | 75 | 122PCMK | 4.5 | 03-23-84 | 4 | 50 | 3 | 13 | I | SO Ce 77 |
| 205 | 2 | 230 | 122MNKN | 11 | 01-24-85 | 4 | 11 | 1 | 2.8 | C | SO Ce 78 |
| 220 | 2 | 240 | 122MNKN | 12 | 04-23-81 | 4 | 10 | 1 | 2.5 | C | SO Ce 79 |
| 205 | 2 | 230 | 122MNKN | 10 | 09-12-84 | 4 | 10 | 1 | 2.5 | T | SO Ce 80 |
| 40 | 4 | 80 | 122PCMK | 2 | 03-30-82 | 5 | 200 | 1 | 40 | I | SO Ce 81 |
| | | | | 0.5m | 04-16-87 | | | | | | |
| 200 | 4 | 230 | 122MNKN | 18 | 03-13-73 | 57 | 25 | 6 | .44 | T | SO Ce 82 |
| 25 | 2 | 30 | 112PCPC | 12 | 06-14-79 | 3 | 80 | 1 | 27 | C | SO Ce 83 |
| +1 -120 | | | | 18 | 04-22-85 | 7 | 50 | 3 | 7.1 | S | SO Ce 84 |
| 120 -180 | 3 | 180 -210 | 122MNKN | | | | | | | | |
| 198 | 6 | 228 | 122MNKN | 26 | 08-16-85 | 102 | 80 | 2 | .78 | U | SO Ce 85 |
| 198 | 6 | 228 | 122MNKN | 28 | 08-16-85 | 102 | 80 | 2 | .78 | S | SO Ce 86 |
| 8 | 2 | 13 | 112PCPC | 2.4m | 04-16-87 | -- | -- | -- | -- | U | SO Ce 87 |
| 7 | 2 | 12 | 112PCPC | 4.7m | 11-24-86 | -- | -- | -- | -- | U | SO Ce 88 |
| 210 | 2 | 230 | 122MNKN | 5 | 08-14-85 | 5 | 22 | 1 | 4.4 | H | SO Ce 90 |
| 170 | 2 | 190 | 122MNKN | -- | -- | 3 | 15 | 1 | 5.0 | H | SO Ce 92 |
| +1 -100 | | | | 12 | 10-02-86 | 1 | 60 | 1 | 60 | H | SO Ce 94 |
| 100 -158 | 2 | 158 -183 | 122MNKN | | | | | | | | |
| 0 -105 | | | | 0 | 10-31-47 | -- | 18 | 3 | -- | H | SO Cf 1 |
| 0 -196.5 | 2 | 196.5-208.5 | 122MNKN | | | | | | | | |
| 208.5-210 | | | | | | | | | | | |
| 12 | 1 | 15 | 112PCPC | 1.5m | 04-14-87 | -- | -- | -- | -- | U | SO Cf 2 |
| 203 | 2 | 215 | 122MNKN | 4 | 03-00-51 | -- | 10 | 6 | -- | H,S | SO Cf 3 |
| 0 -105 | | | | 4.5 | 11-29-47 | -- | 18 | 2.5 | -- | H,S | SO Cf 4 |
| 0 -225.5 | 2 | 225.5-237.5 | 122MNKN | | | | | | | | |
| 237.5-239 | | | | | | | | | | | |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cf 5 |
| 241 | 1.5 | 256 | 122MNKN | 6 | 06-24-47 | 2 | 20 | 3 | 10 | H | SO Cf 6 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cf 7 |
| -- | -- | -- | 112PCPC | 3.1m | 03-27-52 | -- | -- | -- | -- | H,S | SO Cf 8 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cf 9 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cf 10 |
| -- | -- | -- | 112PCPC | 1.8m | 03-27-52 | -- | -- | -- | -- | U | SO Cf 11 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cf 12 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Cf 13 |
| 75 | 2 | 90 | 122PCMK | 12 | 07-29-78 | 3 | 8 | 1 | 2.7 | S | SO Cf 14 |
| 224 | 2 | 244 | 122MNKN | 26 | 07-28-83 | 14 | 15 | 1 | 1.1 | Z | SO Cf 15 |
| 220 | 2 | 240 | 122MNKN | 12 | 12-28-79 | 3 | 10 | 2 | 3.3 | C | SO Cf 16 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; f = flowing well; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers; SAW = Shannahan Art. Well; USGS = U.S. Geological Survey]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Cf 18 | SO-66-0080 | GREENHILL CH OF THE BRETH | FORD | 05-19-66 | 20 | 234 | 2 |
| SO Cf 19 | SO-81-1017 | U.S. GEOLOGICAL SURVEY | USGS | 01-07-87 | 20 | 12 | 2 |
| SO Cf 20 | SO-73-1985 | MICHELS, WALTER | SWD | 11-08-81 | 20 | 35 | 2 |
| SO Cf 21 | SO-81-0925 | MATTHEWS, HELEN | DASHIELL | 07-11-86 | 15 | 93 | 2 |
| SO Cf 22 | SO-73-1979 | UN. CH. OF JESUS CHRIST | BLAKE & CO | -- | 20 | -- | -- |
| SO Cg 1 | -- | BEAUCHAMP, R | BEAUCHAMP | 00-00-49 | 20 | 24 | 1.25 |
| SO Cg 2 | -- | POPE, J MRS | -- | -- | 25 | 19 | 1.25 |
| SO Cg 3 | -- | SOMERSET CO. BOARD OF ED | -- | 00-00-48 | 10 | 11.8 | 1.25 |
| SO Cg 4 | -- | OWEN, MELVIN | -- | 00-00-48 | 20 | 14.5 | 1.25 |
| SO Cg 5 | SO-81-0851 | THOMPSON , WILLIAM | SWD | 04-23-86 | 5 | 220 | 2 |
| SO Cg 6 | SO-65-0030 | CHESAPEAKE EGG CO | SAW | 09-04-64 | 20 | 115 | 4 |
| SO Db 1 | SO-04-7688 | U.S. FISH & WILDLIFE SERV | AARON | 07-24-62 | 5 | 860 | 2.5<br>1.5 |
| SO Dc 1 | -- | U.S. GEOLOGICAL SURVEY | DEL GEO SURV | 11-17-52 | 5 | 64 | 4 |
| SO Dc 2 | SO-01-0513 | WARD, NOAH | CUSICK | 07-30-52 | 5 | 139 | 1.5 |
| SO Dc 3 | SO-67-0007 | U.S. GEOLOGICAL SURVEY | SYDNOR HYDRO | 11-11-66 | 5 | 1,514 | 6<br>4<br>4<br>2<br>2 |
| SO Dc 4 | SO-71-0064 | CITY OF CRISFIELD | DELMARVA DRLNG | 12-05-70 | 5 | 1,200 | 8<br>6 |
| SO Dc 5 | SO-73-1722 | BRAMBLEWOOD ASSOCIATION | IWD | 08-22-80 | 5 | 122 | 4 |
| SO Dc 6 | -- | KATO-CROCKETT SHIPYARD | -- | -- | 5 | -- | -- |
| SO Dd 1 | SO-00-0162 | BLAKE, ALAN F | WHITE | 04-18-46 | 5 | 201 | 2<br>2 |
| SO Dd 2 | SO-00-2036 | GALE, G | CUSICK | 11-06-47 | 10 | 170 | 1.5 |
| SO Dd 3 | SO-00-5169 | DAUGHERTY, O L | CUSICK | 01-06-50 | 5 | 152 | 1.5 |
| SO Dd 4 | SO-00-6589 | TULL, HONISS | WHITE | 07-00-50 | 5 | 33 | 2 |
| SO Dd 5 | SO-00-7607 | COONS, A J | WHITE | 04-00-51 | 10 | 86 | 2 |
| SO Dd 6 | SO-00-8342 | SOMERS, GROVER S | WHITE | 09-00-51 | 10 | 86 | 2 |
| SO Dd 7 | SO-00-8133 | HAISLIP, F C | WHITE | 07-00-51 | 5 | 57 | 2 |
| SO Dd 8 | SO-00-8134 | HAISLIP, F C | WHITE | 07-00-51 | 5 | 100 | 2 |
| SO Dd 9 | SO-00-1919 | WARD, PHILLIP MRS | CUSICK | 10-21-47 | 10 | 91 | 1.5 |
| SO Dd 10 | SO-00-2006 | COULBOURN, DR GEORGE C. | CUSICK | 10-25-47 | 10 | 131 | 1.5 |
| SO Dd 11 | SO-00-3755 | MARION FIRE CO. | WHITE | 04-01-49 | 10 | 81 | 2 |
| SO Dd 12 | SO-00-6442 | PALMER, HAROLD | CUSICK | 08-12-50 | 10 | 192 | 1.5 |
| SO Dd 13 | SO-00-3815 | WHITTINGTON, R BRICE | WHITE | 07-00-49 | 10 | 86 | 2<br>2 |
| SO Dd 14 | SO-00-3814 | SOMMERS, G | WHITE | 07-00-49 | 10 | 84.5 | 2<br>2 |
| SO Dd 15 | SO-00-3816 | PRICE, HOWARD | WHITE | 07-00-49 | 10 | 72 | 2 |
| SO Dd 16 | SO-00-3434 | PUSEY, ROY | WHITE | 12-10-48 | 5 | 88.5 | 2 |
| SO Dd 17 | SO-00-3817 | BUTLER, EARL | WHITE | 07-00-49 | 10 | 75 | 2<br>2 |
| SO Dd 18 | SO-00-3058 | HALL, REGINALD | WHITE | 09-10-48 | 10 | 87 | 2 |
| SO Dd 19 | SO-00-3209 | POWELL, HOWARD | WHITE | 10-22-48 | 10 | 78 | 2 |
| SO Dd 20 | SO-00-5984 | WHITTINGTON, NORMAN | WHITE | 07-00-50 | 10 | 55 | 2 |
| SO Dd 21 | SO-00-1674 | CHAFFEY, W T | CUSICK | 08-14-47 | 5 | 214 | 1.5 |
| SO Dd 22 | SO-00-1651 | CHAFFEY, W T | CUSICK | 08-09-47 | 5 | 220 | 1.5 |
| SO Dd 23 | SO-00-6190 | POWELL, L Q | WHITE | 07-00-50 | 5 | 86 | 2 |
| SO Dd 24 | SO-00-3059 | GREEN, GEO A | WHITE | 09-08-48 | 10 | 95 | 2 |
| SO Dd 25 | SO-00-1604 | BRADSHAW, WM | CUSICK | 07-23-47 | 5 | 155 | 1.5 |
| SO Dd 26 | SO-00-2037 | COULBOURN, N R | CUSICK | 11-01-47 | 10 | 152 | 1.5 |
| SO Dd 27 | SO-00-4062 | STEVENSON, IRA E MRS | CUSICK | 06-04-49 | 10 | 100 | 1.5 |
| SO Dd 28 | SO-00-2118 | HAISLIP, F C | WILSON | 12-05-47 | 5 | 84 | 1.5 |
| SO Dd 29 | SO-00-7193 | ROSS, DR ALEXANDER | CUSICK | 12-26-50 | 5 | 165 | 2 |
| SO Dd 30 | SO-00-5897 | CRISFIELD AIRPORT | CUSICK | 06-16-50 | 5 | 163 | 2.5<br>1.5 |
| SO Dd 31 | SO-00-7663 | CRISFIELD DEHYDRATING CO | CUSICK | 04-24-51 | 10 | 140 | 1.5 |
| SO Dd 32 | SO-00-0762 | COULBOURN, N R | CUSICK | 09-06-46 | 5 | 165 | 3.5<br>2.5<br>1.5 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 216 | 2 | 234 | 122MNKN | 6 | 05-19-66 | -- | 14 | 2 | -- | T | SO Cf 18 |
| 7 | 2 | 12 | 112PCPC | 1.1m | 04-15-87 | -- | -- | -- | -- | U | SO Cf 19 |
| 25 | 2 | 35 | 112PCPC | 6 | 11-08-81 | 2 | 10 | 1 | 5.0 | C | SO Cf 20 |
| | | | | 4.5m | 04-15-87 | | | | | | |
| 83 | 2 | 93 | 122PCMK | 9 | 07-11-86 | 5 | 15 | 1 | 3.0 | H | SO Cf 21 |
| -- | -- | -- | -- | | -- | -- | -- | -- | -- | T | SO Cf 22 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cg 1 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cg 2 |
| -- | -- | -- | 112PCPC | .75 | 02-08-52 | -- | -- | -- | -- | T | SO Cg 3 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Cg 4 |
| 200 | 2 | 220 | 122MNKN | 12.5 | 04-23-86 | 1.5 | 43 | 1 | 29 | H | SO Cg 5 |
| 94 | 3 | 104 | 122PCMK | 13 | 09-04-64 | 20 | 30 | 4 | 1.5 | N | SO Cg 6 |
| 0 - 210 | -- | -- | | +15f | 07-24-62 | -- | 43 | 8 | -- | H | SO Db 1 |
| 210 - 810 | | | 217PTMC | | | | | | | | |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | U | SO Dc 1 |
| 124 | 1.5 | 139 | 122MOCN | 4 | 07-30-52 | 2 | 30 | 1 | 15 | H,S | SO Dc 2 |
| +1.5- 250 | | | | +11 | 11-03-66 | 72.3 | 200 | 5 | 2.8 | U | SO Dc 3 |
| 250 -1,128 | 4 | 1,128 -1,138 | 217PTMC | | | | | | | | |
| 1,138 -1,262 | | | | | | | | | | | |
| 1,262 -1,272 | 2 | 1,272 -1,287 | 217PTMC | | | | | | | | |
| 1,287 -1,308 | | | | | | | | | | | |
| 2 - 199 | | | | +4 | 12-05-70 | 71 | 150 | 12 | 2.1 | P | SO Dc 4 |
| 199 -1,116 | 6 | 1,116 -1,136 | 217PTMC | | | | | | | | |
| 117 | 4 | 122 | 122MOCN | 5 | 08-22-80 | 65 | 35 | 1 | .54 | P | SO Dc 5 |
| | | | | 3.3m | 04-15-87 | | | | | | |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | Z | SO Dc 6 |
| +1.5- 189.5 | 2 | 189.5- 199.5 | 122MNKN | 8 | 04-18-46 | -- | 15 | 3 | -- | H | SO Dd 1 |
| 199.5- 201 | | | | | | | | | | | |
| 149 | 1.5 | 170 | 122MOCN | 2 | 11-06-47 | 5 | 10 | 2 | 2.0 | H | SO Dd 2 |
| 128 | 1.5 | 152 | 122MOCN | 1 | 01-06-50 | -- | 21 | 3 | -- | H | SO Dd 3 |
| 25 | 2 | 33 | 112PCPC | 4 | 07-00-50 | -- | 12 | 2 | -- | S | SO Dd 4 |
| 78 | 2 | 86 | 122PCMK | 7 | 04-00-51 | -- | 10 | 3 | -- | H | SO Dd 5 |
| 75 | 2 | 86 | 122PCMK | 10 | 09-00-51 | -- | 8 | 2 | -- | H | SO Dd 6 |
| 46 | 2 | 56 | 122PCMK | 2.7m | 01-04-52 | -- | 10 | 3 | -- | S | SO Dd 7 |
| 90 | 2 | 100 | 122MOCN | 3 | 07-00-51 | -- | 8 | 4 | -- | H | SO Dd 8 |
| 76 | 1.5 | 91 | 122PCMK | 2 | 10-21-47 | 1 | 30 | 1 | 30 | H | SO Dd 9 |
| 91 | 1.5 | 116 | 122MOCN | 2 | 10-25-47 | 4 | 30 | 2 | 7.5 | H | SO Dd 10 |
| 68 | 2 | 81 | 122PCMK | 2 | 04-01-49 | -- | 15 | 3 | -- | P | SO Dd 11 |
| 182 | 1.5 | 192 | 122MNKN | 3 | 08-12-50 | 2 | 28 | 2 | 14 | H,S | SO Dd 12 |
| 0 - 71 | 2 | 71 - 83 | 122PCMK | 4 | 07-00-49 | -- | 15 | 3 | -- | H | SO Dd 13 |
| 83 - 84.5 | | | | | | | | | | | |
| 0 - 73 | 2 | 73 - 81 | 122PCMK | 3 | 07-00-49 | -- | 14 | 2 | -- | C | SO Dd 14 |
| 81 - 82.5 | | | | | | | | | | | |
| 58 | 2 | 72 | 122PCMK | 3 | 07-00-49 | -- | 12 | 2 | -- | H,S | SO Dd 15 |
| 76.5 | 2 | 88.5 | 122PCMK | 5 | 12-10-48 | -- | 10 | 2 | -- | H | SO Dd 16 |
| 0 - 60 | 2 | 60 - 72 | 122PCMK | 2 | 07-00-49 | -- | 12 | 2 | -- | H | SO Dd 17 |
| 72 - 73.5 | | | | | | | | | | | |
| -- | -- | -- | 122PCMK | -- | -- | -- | 17 | 2 | -- | H | SO Dd 18 |
| 68 | 2 | 78 | 122PCMK | -- | -- | -- | 10 | 2 | -- | H | SO Dd 19 |
| 47 | 2 | 55 | 122PCMK | 8 | 07-00-50 | -- | 12 | 4 | -- | C | SO Dd 20 |
| 199 | 1.5 | 214 | 122MNKN | 4 | 08-14-47 | 4 | 20 | 2 | 5.0 | S | SO Dd 21 |
| 205 | 1.5 | 220 | 122MNKN | 5 | 08-09-47 | 3 | 25 | 3 | 8.3 | H,S | SO Dd 22 |
| 78 | 2 | 86 | 122PCMK | 7 | 07-00-50 | -- | 6 | 3 | -- | S | SO Dd 23 |
| 85 | 2 | 95 | 122PCMK | 6 | 09-08-48 | -- | 10 | 2 | -- | H,S | SO Dd 24 |
| 130 | 1.5 | 155 | 122MOCN | 4 | 07-23-47 | 1 | 20 | 2 | 20 | H,S | SO Dd 25 |
| 131 | 1.5 | 152 | 122MOCN | 2 | 11-01-47 | 5 | 15 | 1 | 3.0 | H | SO Dd 26 |
| 84 | 1.5 | 99 | 122PCMK | 3 | 06-04-49 | 2 | 37.5 | 2 | 19 | H | SO Dd 27 |
| 69 | 1.5 | 84 | 122PCMK | 2 | 12-05-47 | 10 | 12 | 4 | 1.2 | U | SO Dd 28 |
| 145 | 2 | 165 | 122MOCN | 4 | 12-26-50 | 6 | 18 | 3 | 3.0 | H | SO Dd 29 |
| 0 - 84 | | | | 3 | 06-16-50 | 4 | 25 | 6 | 6.3 | C | SO Dd 30 |
| 84 - 148 | -- | 163 | 122MOCN | | | | | | | | |
| 125 | -- | 140 | 122MOCN | 3 | 04-24-51 | 3 | 30 | 1 | 10 | C | SO Dd 31 |
| +1.5- 50 | | | | .5 | 09-06-46 | .5 | 25 | 3 | 50 | H,S | SO Dd 32 |
| 50 - 90 | | | | | | | | | | | |
| 90 - 145 | -- | 145 - 155 | 122MOCN | | | | | | | | |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers]

| Local well no. | Permit number | Owner | Contractor | Date well con- structed | Alti- tude of land sur- face (ft) | Depth drilled (ft) | Diam- eter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Dd 33 | -- | COULBOURN, N R | CUSICK | 04-03-49 | 5 | 147 | 1.5 |
| SO Dd 34 | -- | COULBOURN, N R | CUSICK | 11-01-47 | 5 | 152 | 1.5 |
| SO Dd 35 | SO-00-4269 | RUEBEN, HERMAN | CUSICK | 07-10-49 | 5 | 150 | 1.5 |
| SO Dd 36 | SO-00-0489 | CHAS D BRIDDELL INC | CUSICK | 08-14-46 | 5 | 155 | 3.5 |
| | | | | | | | 2.5 |
| | | | | | | | 1.5 |
| SO Dd 37 | SO-00-1608 | NELSON, J FRANK | CUSICK | 07-22-47 | 5 | 166.5 | 1.5 |
| SO Dd 38 | SO-00-0488 | STERLING, HAROLD E, JR | CUSICK | 06-20-46 | 5 | 152 | 3.5 |
| | | | | | | | 2.5 |
| | | | | | | | 1.5 |
| SO Dd 39 | SO-00-0816 | LONG, JESSE L | CUSICK | 09-26-46 | 5 | 160 | 1.5 |
| SO Dd 40 | SO-00-4573 | STERLING, RINGGOLD | CUSICK | 09-28-49 | 5 | 152 | 1.5 |
| SO Dd 41 | SO-00-1673 | DAUGHERTY, WILLIAM B | CUSICK | 08-01-47 | 5 | 149 | 1.5 |
| SO Dd 42 | SO-00-4146 | LAWSON, ALFRED J | CUSICK | 06-20-49 | 5 | 150 | 1.5 |
| SO Dd 43 | SO-00-3789 | NELSON, BENJAMIN F | CUSICK | 04-07-49 | 5 | 149 | 1.5 |
| SO Dd 44 | SO-00-3790 | COULBOURN, NELSON R | CUSICK | 04-02-49 | 5 | 147 | 1.5 |
| SO Dd 45 | SO-01-0067 | REVELLE, SAMUEL J | CUSICK | 05-23-52 | 5 | 163 | 1.5 |
| SO Dd 46 | SO-73-1289 | GRUY FEDERAL, INC | GLASCOCK | 08-29-78 | 5 | 1,020 | 8.63 |
| | | | | | | | 4.5 |
| SO Dd 47 | 79-GEA-001 | GRUY FEDERAL, INC | ROWAN | 07-18-79 | 3.5 | 5,562 | 16 |
| | | | | | | | 10.75 |
| | | | | | | | 7.63 |
| | | | | | | | 7.63 |
| | | | | | | | 7.63 |
| | | | | | | | 7.63 |
| SO Dd 48 | SO-73-1299 | DAUGHERTY, WILLIAM B | FORD | 10-12-78 | 10 | 155 | 2 |
| SO Dd 49 | SO-73-0347 | MROHS METERED GAS SERVICE | SWD | 08-20-74 | 10 | 148 | 2 |
| SO Dd 50 | SO-73-1721 | MT. PEER CHURCH | SWD | 06-27-80 | 10 | 62 | 2 |
| SO Dd 51 | SO-73-0385 | PINE RIDGE BAPTIST CH | BUNDICK | 06-10-75 | 5 | 148 | 2 |
| SO Dd 52 | SO-73-1587 | TRINITY METHODIST CHURCH | SWD | 11-07-79 | 10 | 150 | 2 |
| SO Dd 53 | -- | MARION FIRE CO | SWD | -- | 10 | -- | 2 |
| SO Dd 54 | SO-73-0663 | HIGHWAY HOLINESS CHURCH | FORD | 04-07-76 | 10 | 145 | 2 |
| SO Dd 55 | SO-71-0073 | SOMERSET CO. BOARD OF ED | BUNDICK | 07-19-71 | 10 | 75 | 4 |
| SO Dd 56 | SO-73-0269 | CRISFIELD ELKS CLUB | FORD | 03-25-74 | 10 | 142 | 2 |
| SO Dd 57 | SO-73-1175 | CRISFIELD ELKS CLUB | FORD | 03-30-78 | 10 | 100 | 2 |
| SO Dd 58 | SO-73-0576 | WHITTINGTON, THOMAS | DELMARVA DRLNG | 11-07-75 | 10 | 95 | 4 |
| SO Dd 59 | SO-73-1961 | DAUGHERTY, WILLIAM | SWD | 09-09-81 | 5 | 155 | 4 |
| SO Dd 60 | SO-73-1989 | ABBOTT, M E | SWD | 09-30-81 | 5 | 160 | 4 |
| | | | | | | | 3 |
| SO Dd 61 | SO-71-0053 | EDER, G H | IWD | 11-28-70 | 10 | 154 | 4 |
| SO Dd 62 | SO-70-0026 | BYRD, MELVIN | FORD | 10-20-69 | 10 | 145 | 2 |
| SO Dd 63 | SO-81-0689 | SCHARZ, HENRY | SWD | 11-06-85 | 8 | 160 | 2 |
| SO Dd 64 | SO-81-0767 | BRITTINGHAM, JOHN | BUNDICK | 12-15-85 | 5 | 185 | 2 |
| SO Dd 65 | SO-81-0694 | FOXWELL, MACE | SWD | 08-18-85 | 5 | 160 | 2 |
| SO Dd 66 | SO-81-0673 | LINTON, WILLIAM | SWD | 07-15-85 | 8 | 160 | 2 |
| SO Dd 67 | SO-81-0762 | GOLDSBOROUGH, CHARLES | SWD | 12-05-85 | 8 | 160 | 2 |
| SO Dd 68 | SO-81-0684 | MATARAZZO, GEORGE | LARSON WELLS | 07-30-85 | 5 | 160 | 2 |
| SO Dd 69 | SO-81-0782 | WHITELOCK, LELAND | SWD | 02-14-86 | 8 | 155 | 2 |
| SO Dd 70 | SO-81-0897 | EVANS, WILLIAM | SWD | 06-13-86 | 5 | 155 | 2 |
| SO Dd 71 | SO-81-1073 | BERKEYPILE, JIM | SWD | 05-27-87 | 5 | 152 | 2 |
| SO Dd 72 | SO-81-1088 | SIEGMANN, RAY | SWD | 06-04-87 | 5 | 145 | 2 |
| SO Dd 73 | SO-81-1009 | DORMAN, LADELL | SWD | 11-12-86 | 5 | 165 | 2 |
| SO De 1 | SO-00-9081 | GREEN, CARL | WHITE | 03-00-52 | 10 | 420 | -- |
| SO De 2 | SO-00-7608 | PRICE, EARL | WHITE | 04-00-51 | 10 | 81 | 2 |
| SO De 3 | SO-00-8343 | WHITTINGTON, NORMAN T | WHITE | 10-00-51 | 10 | 120 | 2 |
| SO De 4 | SO-00-8877 | CHAMBERLIN, ROBERT L | CUSICK | 11-07-51 | 10 | 93 | 2 |
| SO De 5 | SO-00-1010 | BOWLAND, J E | CUSICK | 11-29-46 | 10 | 90 | 1.5 |
| SO De 6 | SO-00-4760 | BONNEVILLE, MITCHELL | WHITE | 10-23-49 | 10 | 116 | 2 |
| | | | | | | | 2 |
| SO De 7 | SO-00-3754 | GREEN, J B | WHITE | 03-23-49 | 10 | 118 | 2 |
| | | | | | | | 2 |
| SO De 8 | SO-00-5501 | COULBOURN, GEO DR | WHITE | 04-17-50 | 10 | 117 | 2 |
| SO De 9 | SO-00-5500 | HALL, ROGER | WHITE | 04-24-50 | 5 | 91 | 2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 132 | 1.5 | 147 | 122MOCN | -- | -- | -- | -- | -- | -- | H,S | SO Dd 33 |
| 131 | 1.5 | 152 | 122MOCN | -- | -- | -- | -- | -- | -- | S | SO Dd 34 |
| 125 | 1.5 | 150 | 122MOCN | 3 | 07-10-49 | 8 | -- | 3 | -- | H,S | SO Dd 35 |
| +1.5- 50 | | | | 22 | 08-14-46 | 4 | 10 | 3 | 2.5 | H,S | SO Dd 36 |
| 50 - 90 | | | | | | | | | | | |
| 90 - 150 | -- | 150 - 155 | 122MOCN | | | | | | | | |
| +1.5- 151.5 | 1.5 | 151.5- 166 | 122MOCN | 4 | 07-22-47 | 2 | 20 | 2 | 10 | H,S | SO Dd 37 |
| +.5- 50 | | | | 3.5 | 06-20-46 | -- | 10 | 3 | -- | H | SO Dd 38 |
| 50 - 90 | | | | | | | | | | | |
| 90 - 134 | 1.5 | 134 - 152 | 122MOCN | | | | | | | | |
| 150 | 1.5 | 160 | 122MOCN | 4 | 09-26-46 | .5 | 15 | 2 | 30 | H,S | SO Dd 39 |
| 142 | 1.5 | 152 | 122MOCN | 2 | 09-28-49 | 14 | 28 | 3 | 2.0 | H | SO Dd 40 |
| 124 | 1.5 | 149 | 122MOCN | 3.5 | 08-01-47 | 3.5 | 12 | 3 | 3.4 | H,S | SO Dd 41 |
| 125 | 1.5 | 150 | 122MOCN | 3 | 06-20-49 | 2 | 12 | 3 | 6.0 | H | SO Dd 42 |
| 124 | 1.5 | 149 | 122MOCN | 1 | 04-07-49 | 4 | 18 | 2 | 4.5 | H,S | SO Dd 43 |
| 132 | 1.5 | 147 | 122MOCN | .5 | 04-02-49 | 2.5 | 25 | 2 | 10 | H | SO Dd 44 |
| 148 | 1.5 | 163 | 122MOCN | 2 | 05-23-52 | 3 | 30 | 2 | 10 | H | SO Dd 45 |
| 0 - 136 | | | | -- | -- | -- | -- | -- | -- | U | SO Dd 46 |
| 136 -1,020 | | | 217PTMC | | | | | | | | |
| 0 - 165 | | | | -- | -- | -- | -- | -- | -- | U | SO Dd 47 |
| 165 -1,715 | | | | | | | | | | | |
| 1,715 -3,798 | 7.63 | 3,798 -3,846 | 217PTMC | | | | | | | | |
| 3,846 -3,901 | 7.63 | 3,901 -4,032 | 217PTMC | | | | | | | | |
| 4,032 -4,148 | 7.63 | 4,148 -4,223 | 217PTMC | | | | | | | | |
| 4,223 -4,625 | | | | | | | | | | | |
| 135 | 2 | 155 | 122MOCN | 8 | 10-12-78 | 4 | 10 | 1 | 2.5 | N | SO Dd 48 |
| 138 | 2 | 148 | 122MOCN | 7 | 08-20-74 | 31 | 20 | 4 | .65 | C | SO Dd 49 |
| 52 | 2 | 62 | 122PCMK | 10 | 06-27-80 | 2 | 9 | 1 | 4.5 | T | SO Dd 50 |
| 138 | 2 | 148 | 122MOCN | 5 | 06-10-75 | 41 | 12 | 3 | .29 | T | SO Dd 51 |
| 125 | 2 | 150 | 122MOCN | 12 | 11-07-79 | 3 | 10 | 2 | 3.3 | T | SO Dd 52 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | -- | SO Dd 53 |
| 130 | 2 | 145 | 122MOCN | 6 | 04-07-76 | 2 | 10 | 2 | 5.0 | T | SO Dd 54 |
| 65 | 4 | 75 | 122PCMK | 4 | 07-19-71 | 16 | 40 | 4 | 2.5 | T | SO Dd 55 |
| 130 | 2 | 142 | 122MNKN | 18 | 03-25-74 | 4 | 10 | 2 | 2.5 | C | SO Dd 56 |
| 70 | 2 | 100 | 122MOCN | 8 | 03-30-78 | 2 | 15 | 3 | 7.5 | C | SO Dd 57 |
| 70 | 4 | 85 | 122PCMK | 6 | 11-07-75 | 19 | 61 | 1 | 3.3 | I | SO Dd 58 |
| | | | | 3.0m | 04-15-87 | | | | | | |
| 130 | 4 | 155 | 122MOCN | 12 | 09-09-81 | 3 | 10 | 1 | 3.3 | H | SO Dd 59 |
| +2 - 80 | | | | 8 | 09-30-81 | 5 | 10 | 1 | 2.0 | H | SO Dd 60 |
| 80 - 140 | 3 | 140 - 160 | 122MOCN | 3.4m | 04-15-87 | | | | | | |
| 154 | 4 | 154 | 122MOCN | 10 | 11-28-70 | 20 | 15 | 4 | .75 | H | SO Dd 61 |
| 129 | -- | 145 | 122MOCN | 6 | 10-20-69 | 5 | 20 | 2 | 4.0 | N | SO Dd 62 |
| 140 | 2 | 160 | 122MOCN | 20 | 11-06-85 | 1 | 45 | 1 | 45 | H | SO Dd 63 |
| 175 | 2 | 185 | 122MNKN | 5 | 12-15-85 | 40 | 20 | 3 | .50 | H | SO Dd 64 |
| 140 | 2 | 160 | 122MOCN | 7 | 08-18-85 | 3 | -- | 1 | -- | H | SO Dd 65 |
| 140 | 2 | 160 | 122MNKN | 6 | 07-15-85 | 6 | 30 | 1 | 5.0 | H | SO Dd 66 |
| 140 | 2 | 160 | 122MOCN | 6 | 12-05-85 | 1 | 40 | 1 | 40 | H | SO Dd 67 |
| 140 | 2 | 160 | 122MOCN | 10 | 07-30-85 | 5 | 40 | 3 | 8.0 | H | SO Dd 68 |
| 135 | 2 | 155 | 122MOCN | 5 | 02-14-86 | 1 | 45 | 1 | 45 | H | SO Dd 69 |
| 135 | -- | 155 | 122MOCN | 15 | 06-13-86 | 10 | 20 | 1 | 2.0 | H | SO Dd 70 |
| 122 | 2 | 152 | 122MOCN | 15 | 05-27-87 | 3 | 38 | 1 | 13 | H | SO Dd 71 |
| 115 | -- | 145 | 122MOCN | 5 | 06-04-87 | 30 | 10 | 1 | .30 | H | SO Dd 72 |
| 145 | -- | 165 | 122MOCN | 10 | 11-12-86 | 1 | 60 | 1 | 60 | H | SO Dd 73 |
| -- | -- | -- | 122CPNK | -- | -- | -- | -- | -- | -- | U | SO Da 1 |
| 70 | 2 | 80 | 122PCMK | 5 | 04-00-51 | -- | 10 | 3 | -- | H,S | SO De 2 |
| 108 | 2 | 120 | 122PCMK | 2 | 10-00-51 | -- | 12 | 2 | -- | U | SO De 3 |
| | | | | 3.3m | 01-04-52 | | | | | | |
| 85 | 2 | 93 | 122PCMK | 4 | 11-07-51 | 1 | 25 | 2 | 25 | H,S | SO Da 4 |
| 75 | 1.5 | 90 | 122PCMK | 3 | 11-29-46 | .5 | 25 | 1 | 50 | S | SO De 5 |
| 0 - 106 | 2 | 106 - 114 | 122PCMK | -- | -- | -- | 12 | 4 | -- | H | SO De 6 |
| 114 - 116 | | | | | | | | | | | |
| 0 - 106 | 2 | 106 - 116 | 122PCMK | 2 | 03-23-49 | -- | 12 | 2 | -- | H | SO De 7 |
| 116 - 118 | | | | | | | | | | | |
| 107 | 2 | 117 | 122PCMK | 3 | 04-17-50 | -- | 10 | 3 | -- | H,S | SO Da 8 |
| 81 | 2 | 91 | 122PCMK | 4 | 04-24-50 | -- | 8 | 4 | -- | H,S | SO De 9 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; CD&P = Coastal Drilling and Pump; IWD = Ideal Well Drillers; USGS = U.S. Geological Survey]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO De 10 | SO-00-5569 | ADAMS, MITCHELL W | WHITE | 03-30-50 | 5 | 88 | 2 |
| SO De 11 | SO-00-5568 | LANDON, EDWARD | WHITE | 04-03-50 | 10 | 112 | 2 |
| SO De 12 | SO-00-1892 | GREEN, CARL, JR | CUSICK | 10-14-47 | 10 | 150 | 1.5 |
| SO De 13 | SO-00-0869 | WILLIAMS, EDWARD S | CUSICK | 10-11-46 | 5 | 108 | 1.5 |
| SO De 14 | SO-00-3210 | HALL, B J | CUSICK | 12-20-48 | 5 | 75 | 1.5 |
| SO De 15 | SO-00-0837 | CHELTON, GUY | CUSICK | 10-31-46 | 10 | 100 | 2 |
| SO De 16 | SO-00-6191 | WILKINS, PAUL | WHITE | 07-00-50 | 10 | 87 | 2 |
| SO De 17 | -- | DAVIS, H A | DAVIS | 00-00-49 | 10 | 9 | 1.25 |
| SO De 18 | -- | ADAMS, F | -- | 00-00-40 | 10 | 48.5 | 1.25 |
| SO De 19 | -- | MATHEWS LUMBER & CANNING CO | TODD | 00-00-48 | 10 | 75 | 2 |
| SO De 20 | -- | DASHIELL, A T | DASHIELL | 00-00-49 | 10 | 23 | 1.25 |
| SO De 21 | -- | MILLER, C | -- | 00-00-25 | 15 | 13 | 1.25 |
| SO De 22 | -- | HAYMAN, C | -- | 00-00-32 | 10 | 35 | 1.25 |
| SO De 23 | -- | GERALD, J | -- | -- | 5 | 10.8 | 36 |
| SO De 24 | -- | TAYLOR, L | CUSICK | 00-00-40 | 5 | 100 | 1.25 |
| SO De 25 | -- | SCHUMACHER, WILLIAM C | SCHUMACHER | 00-00-51 | 10 | 34 | 1.5 |
| SO De 26 | SO-00-1742 | HARTMAN, CLARENCE E | CUSICK | 10-06-47 | 10 | 120 | 1.5 |
| SO De 27 | SO-73-1389 | GRUY FEDERAL INC | GLASCOCK | 11-16-78 | 5 | 1,037 | 4.5 |
| SO De 28 | SO-73-1394 | GRUY FEDERAL INC | GLASCOCK | 11-18-78 | 5 | 1,051 | 4.5 |
| SO De 29 | SO-81-0211 | EBENEZER METHODIST CH | SWD | 04-06-83 | 10 | 100 | 2 |
| SO De 30 | SO-68-0075 | REHOBETH METHODIST CHURCH | FORD | 04-30-68 | 10 | 90 | 2 |
| SO De 31 | SO-73-0604 | DASHIELL, A T | FORD | 01-05-76 | 10 | 100 | 2 |
| SO De 32 | SO-73-1858 | WHITTINGTON, PAUL T | DELMARVA DRLNG | 05-06-81 | 10 | 120 | 16 |
| SO De 33 | SO-73-1857 | WHITTINGTON, PAUL T | DELMARVA DRLNG | 04-15-81 | 10 | 130 | 4 |
| SO De 34 | SO-81-0526 | BUTLER, DENNETT | DELMARVA DRLNG | 11-27-84 | 10 | 105 | 2 |
| SO De 35 | SO-73-1866 | BUTLER, DENNETT | DELMARVA DRLNG | 04-13-81 | 10 | 110 | 4 |
| SO De 36 | SO-81-0560 | BUTLER, DENNETT | DELMARVA DRLNG | 03-04-85 | 10 | 110 | 4 |
| SO De 38 | SO-81-0037 | HOWARD, PETE | CD&P | 03-30-82 | 10 | 90 | 4 |
| SO De 39 | SO-81-0172 | SIX L'S ENNIS FARM | CD&P | 02-22-82 | 10 | 120 | 8<br>8 |
| SO De 40 | SO-81-1019 | U.S. GEOLOGICAL SURVEY | USGS | 01-05-87 | 5 | 12 | 2 |
| SO De 41 | SO-81-0751 | HOOD, SHERMAN | SWD | 10-00-85 | 5 | 80 | 2 |
| SO De 42 | SO-81-0712 | FULTON, WILLIAM | SWD | 09-05-85 | 5 | 210 | 2 |
| SO Df 1 | SO-00-6229 | BELL, GEO W | WHITE | 07-00-50 | 5 | 82 | 2 |
| SO Df 2 | SO-00-7089 | UNDERHILL, ELIZABETH S | CUSICK | 12-09-51 | 5 | 440 | 1.5 |
| SO Df 3 | -- | KURTZ, JOHN | -- | 00-00-51 | 10 | 34 | 1.25 |
| SO Df 4 | -- | MARRINER, L | MARRINER | -- | 10 | 15 | 1.25 |
| SO Df 5 | -- | CLUFF, F | -- | -- | 10 | 27 | 1.25 |
| SO Df 6 | -- | POWELL, G | POWELL | -- | 15 | 20 | 1.25 |
| SO Df 7 | -- | DRYDEN, R L | -- | -- | 15 | 8.8 | 24 |
| SO Df 8 | -- | MCCREADY, S T | BEAUCHAMP | 00-00-47 | 20 | 23 | 1.25 |
| SO Df 9 | SO-73-0375 | STEVENSON EQUIP. COMPANY | BUNDICK | 11-04-74 | 20 | 300 | 4 |
| SO Df 10 | SO-73-1975 | CHESAPEAKE BAY PLYWOOD | BUNDICK | 09-20-81 | 10 | 210 | 4<br>2 |
| SO Df 11 | SO-66-0067 | CHESAPEAKE BAY PLYWOOD | SYDNOR HYDRO | 03-01-66 | 10 | 178 | 8<br>6<br>6<br>6 |
| SO Df 12 | SO-73-1190 | CHESAPEAKE BAY PLYWOOD | DELMARVA DRLNG | 04-12-78 | 10 | 130 | 10 |
| SO Df 13 | SO-81-0027 | LANKFORD FOODS | SWD | 12-29-81 | 20 | 280 | 2 |
| SO Df 14 | SO-67-0012 | LANKFORD, ARTHUR W, JR | MARSHALL | 08-09-66 | 20 | 69 | 2 |
| SO Df 15 | SO-81-0098 | HOLLY GROVE MENNONITE CH. | SWD | 07-05-82 | 20 | 85 | 2 |
| SO Df 16 | SO-81-0065 | HOLLY GROVE MENNONITE CH. | SWD | 05-20-82 | 20 | 80 | 2 |
| SO Df 17 | SO-73-1694 | COWGER, PAUL W | L E COWGER | 05-30-80 | 20 | 20 | 2 |
| SO Df 18 | SO-73-1890 | BUTLER, DENNETT | DELMARVA DRLNG | 04-10-81 | 10 | 90 | 4 |
| SO Df 19 | SO-73-1851 | BUTLER, DENNETT | DELMARVA DRLNG | 04-09-81 | 10 | 130 | 4 |
| SO Df 20 | SO-81-0785 | BUTLER, DENNETT | DELMARVA DRLNG | 03-27-85 | 10 | 105 | 4 |
| SO Df 21 | -- | BUTLER, DENNETT | | 00-00-81 | 5 | 120 | 4 |
| SO Df 22 | SO-73-1877 | VESSEY'S ORCHARD | DELMARVA DRLNG | 04-08-81 | 10 | 130 | 4 |
| SO Df 23 | SO-81-0061 | VESSEY, WILLIAM | COASTAL DRLNG | 04-29-82 | 10 | 100 | 6 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 76 | 2 | 86 | 122PCMK | 2 | 03-30-50 | -- | 8 | 4 | -- | H | SO Da 10 |
| 102 | 2 | 112 | 122PCMK | 3.5 | 04-03-50 | -- | 8 | 5 | -- | H | SO De 11 |
| 125 | 1.5 | 150 | 122MOCN | 5 | 10-14-47 | 5 | 8 | 4 | 1.6 | H | SO De 12 |
| 98 | -- | 108 | 122PCMK | .5 | -- | .2 | 25 | 1 | 125 | H,S | SO De 13 |
| 55 | 1.5 | 75 | 122PCMK | 0 | 12-20-48 | 6 | 35 | 1 | 5.8 | H,S | SO De 14 |
| 88 | 2 | 100 | 122PCMK | 2 | 10-31-46 | .5 | 30 | 1 | 60 | H,S | SO Da 15 |
| 81 | 2 | 87 | 122PCMK | 4 | 07-00-50 | -- | 10 | 3 | -- | H,S | SO Da 16 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO De 17 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO De 18 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H,N | SO De 19 |
| -- | -- | -- | 112PCPC | 3.0m | 03-26-52 | -- | -- | -- | -- | P | SO De 20 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO De 21 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Da 22 |
| -- | -- | -- | 112PCPC | .6m | 03-26-52 | -- | -- | -- | -- | H,S | SO Da 23 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H,S | SO De 24 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO De 25 |
| 110 | 1.5 | 120 | 122PCMK | 3 | 10-06-47 | 2 | 20 | 2 | 10 | H,S | SO De 26 |
| 1,037 | -- | -- | 125PLCN | -- | -- | -- | -- | -- | -- | U | SO De 27 |
| 1,033 | -- | -- | 125PLCN | -- | -- | -- | -- | -- | -- | U | SO De 28 |
| 85 | 2 | 100 | 122PCMK | 5 | 04-06-83 | 5 | 20 | 1 | 4.0 | T | SO De 29 |
| 82 | 2 | 90 | 122PCMK | 7 | 04-30-68 | -- | 10 | 2 | -- | T | SO De 30 |
| 85 | 2 | 100 | 122PCMK | 5 | 01-05-76 | 2 | 10 | 3 | 5.0 | H | SO De 31 |
| 38 | 16 | 118 | 122PCMK | 27 | 05-06-81 | 35 | 400 | 2 | 11 | I | SO De 32 |
| 38 | 4 | 118 | 122PCMK | 5 | 04-15-81 | 8 | 60 | 2 | 7.5 | U | SO De 33 |
| | | | | 3.9m | 04-15-87 | | | | | | |
| 37 | 4 | 97 | 122PCMK | 4 | 11-27-84 | 5 | 35 | 3 | 7.0 | I | SO De 34 |
| 40 | 4 | 100 | 122PCMK | 4 | 04-13-81 | 3 | 60 | 2.5 | 20 | I | SO Da 35 |
| 40 | 4 | 100 | 122PCMK | 3 | 03-04-85 | 13 | 74 | 1 | 5.7 | I | SO De 36 |
| | | | | 2.8m | 12-10-87 | | | | | | |
| 50 | 4 | 90 | 122PCMK | 5 | 03-30-82 | 5 | 200 | 1 | 40 | I | SO De 38 |
| 0- 20 | 8 | 20- 40 | 122PCMK | 10 | 02-22-82 | 10 | 500 | 5 | 50 | I | SO De 39 |
| 40- 60 | 8 | 60- 120 | 122PCMK | 2.5m | 04-15-87 | | | | | | |
| 7 | 2 | 12 | 112PCPC | 0.8m | 04-15-87 | -- | -- | -- | -- | U | SO De 40 |
| 60 | 2 | 80 | 112PCPC | 5 | 10-00-85 | 3 | 35 | 1 | 12 | H | SO De 41 |
| 185 | 2 | 210 | 122MNKN | 10 | 09-05-85 | 1 | 35 | 1 | 35 | H | SO De 42 |
| 70 | 2 | 82 | 122PCMK | 3 | 07-00-50 | -- | 8 | 4 | -- | H,S | SO Df 1 |
| 420 | 1.5 | 440 | 122CPNK | 1.5 | 12-09-51 | 6.5 | 30 | 6 | 4.6 | H,S | SO Df 2 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Df 3 |
| -- | -- | -- | 112PCPC | | | -- | -- | -- | -- | H,S | SO Df 4 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Df 5 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Df 6 |
| -- | -- | -- | 112PCPC | 1.32m | 03-25-52 | -- | -- | -- | -- | H | SO Df 7 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | S | SO Df 8 |
| 250 | 4 | 290 | 122MNKN | 18 | 11-04-74 | 54 | 10 | 5 | .19 | C | SO Df 9 |
| | | | | 20.2m | 04-15-87 | | | | | | |
| +1- 100 | | | | 18 | 09-20-81 | 21 | 30 | 2 | 1.4 | N | SO Df 10 |
| 100- 190 | 2 | 190- 210 | 122MNKN | | | | | | | | |
| 0- 81 | 6 | 81- 91 | 122PCMK | 22 | 03-01-66 | 53 | 307 | 24 | 5.8 | N | SO Df 11 |
| 91- 99 | 6 | 99- 109 | 122PCMK | | | | | | | | |
| 109- 116 | 6 | 16- 126 | 122PCMK | | | | | | | | |
| 126- 131 | | | | | | | | | | | |
| 110 | 10 | 130 | 122PCMK | 15 | 04-12-78 | 13 | 300 | 6 | 23 | N | SO Df 12 |
| 250 | 2 | 280 | 122MNKN | 12 | 12-29-81 | 8 | 10 | 1 | 1.3 | C | SO Df 13 |
| 65 | 2 | 69 | 122PCMK | -- | -- | -- | 12 | 1 | -- | H | SO Df 14 |
| 70 | 2 | 85 | 122PCMK | 7 | 07-05-82 | 5 | 15 | 1 | 3.0 | T | SO Df 15 |
| 70 | 2 | 80 | 122PCMK | 10 | 05-20-82 | 5 | 10 | 1 | 2.0 | T | SO Df 16 |
| 16 | 2 | 20 | 112PCPC | 8 | 05-30-80 | -- | 5 | 1 | -- | C | SO Df 17 |
| 10 | 4 | 79 | 122PCMK | 3 | 04-10-81 | 2 | 50 | 2.5 | 25 | I | SO Df 18 |
| 59 | 4 | 119 | 122PCMK | 3 | 04-09-81 | 2 | 60 | 2.5 | 30 | I | SO Df 19 |
| 25 | 4 | 76 | 122PCMK | 1 | 03-27-85 | 7 | 150 | 3 | 21 | I | SO Df 20 |
| -- | -- | 120 | 122PCMK | 5.7m | 04-15-87 | 19 | 39 | 1 | 2.1 | U | SO Df 21 |
| 38 | 4 | 118 | 122PCMK | 4 | 04-08-81 | 5 | 60 | 2 | 12 | I | SO Df 22 |
| | | | | 3.0m | 04-15-87 | | | | | | |
| 80 | 6 | 100 | 122PCMK | 15 | 04-29-82 | 5 | 200 | 1 | 40 | I | SO Df 23 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; f = flowing well; SWD = Somerset Well Drilling; IWD = Ideal Well Drillers; SAW = Shannahan Art. Well; PI&CS = The Packers Ice and Cold Storage Company]

| Local well no. | Permit number | Owner | Contractor | Date well con-structed | Alti-tude of land sur-face (ft) | Depth drilled (ft) | Diam-eter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Df 24 | SO-81-0076 | VESSEY, WILLIAM | COASTAL DRLNG | 00-00-82 | 20 | 95 | 8 |
| SO Df 25 | SO-73-1876 | DRYDEN, ELMO | DELMARVA DRLNG | 04-07-81 | 20 | 110 | 4 |
| SO Df 26 | SO-73-1875 | DRYDEN, ELMO | DELMARVA DRLNG | 04-06-81 | 20 | 100 | 4 |
| SO Df 27 | SO-81-0593 | MALIN, GEORGE | SWD | 04-16-85 | 10 | 80 | 2 |
| SO Df 28 | SO-81-0859 | BIG APPLE MARKET | SWD | 06-21-86 | 15 | 240 | 4<br>2 |
| SO Dg 1 | -- | JOHNSON MEAT PRODUCTS INC. | SCOTT BROS | 00-00-42 | 5 | 95 | 2 |
| SO Dg 2 | -- | JOHNSON MEAT PRODUCTS INC. | SCOTT BROS | 00-00-39 | 5 | 95 | 2 |
| SO Dg 4 | SO-66-0066 | CHESAPEAKE BAY PLYWOOD | SYDNOR HYDRO | 03-15-66 | 5 | 154 | 8<br>6<br>6<br>6 |
| SO Dg 5 | SO-73-0160 | CORBIN MEAT PACKING CO | BUNDICK | 08-08-73 | 10 | 200 | 2 |
| SO Dg 6 | SO-73-0090 | CHOPTANK ELECTRIC COOP | IWD | 07-26-73 | 10 | 85 | 4 |
| SO Dg 7 | SO-73-0137 | SOMERSET CO. LIQUOR BOARD | FORD | 07-17-73 | 10 | 100 | 2 |
| SO Dg 8 | SO-67-0100 | RIVERVIEW MARKET | FORD | 02-03-67 | 10 | 78 | 2 |
| SO Dg 9 | SO-66-0087 | SOMERSET PACKING COMPANY | FORD | 07-22-66 | 10 | 98 | 2 |
| SO Dg 10 | SO-81-0834 | MARSHALL, DORSEY | SWD | 04-14-86 | 10 | 220 | 2 |
| SO Ea 1 | SO-00-0023 | LORA C & BEN WHITELOCK | CUSICK | 09-20-45 | 2 | 841 | 3.5<br>1.5<br>1 |
| SO Ea 2 | SO-00-0047 | BRADSHAW, HARVEY | CUSICK | 10-11-45 | 2 | 840 | 3.5<br>2.5<br>1.5 |
| SO Ea 3 | SO-00-0076 | EVANS, WILLIE | CUSICK | 10-31-45 | 2 | 865 | 2.5<br>1.5 |
| SO Ea 4 | SO-00-0077 | EVANS, CHARLTON | CUSICK | 02-09-46 | 2 | 852 | 2.5<br>1.5 |
| SO Ea 5 | SO-00-0133 | MIDDLETON, CLAYTON | CUSICK | 03-27-46 | 2 | 850 | 2.5<br>1.5 |
| SO Ea 6 | SO-00-0295 | EVANS, MARY W. MRS | CUSICK | 05-10-46 | 2 | 860 | 2.5<br>1.5 |
| SO Ea 7 | SO-00-2950 | HOFFMAN, ROLAND MRS | CUSICK | 09-23-48 | 2 | 848 | 2.5<br>1.5 |
| SO Ea 8 | SO-00-2951 | EVANS, MILTON | CUSICK | 09-02-48 | 2 | 871 | 2.5<br>1.5 |
| SO Ea 9 | SO-00-3120 | MARSH, ARCHIE MRS | CUSICK | 11-11-48 | 2 | 915 | 2.5<br>1.5 |
| SO Ea 10 | -- | TYLER, SCHULTZ | -- | 00-00-15 | 2 | 7.2 | 24 |
| SO Ea 11 | SO-70-0030 | FOWLER, JOHN | FORD | 03-17-70 | 5 | 1,060 | 2 |
| SO Ea 12 | SO-70-0042 | MARSH, CHARLIE | FORD | 03-12-70 | 5 | 940 | 4 |
| SO Ea 13 | SO-72-0047 | EWELL WATER WORKS | DELMARVA DRLNG | 11-15-71 | 2 | 960 | 4 |
| SO Ec 1 | -- | CITY OF CRISFIELD | SAW | 12-00-37 | 5 | 994 | 8<br>6 |
| SO Ec 2 | -- | CITY OF CRISFIELD | SAW | 00-00-38 | 5 | 997 | 8<br>6 |
| SO Ec 3 | -- | CITY OF CRISFIELD | SAW | 00-00-28 | 5 | 1,076 | 10<br>8<br>6<br>4.5 |
| SO Ec 4 | SO-00-2205 | CITY OF CRISFIELD | LAYNE ATLNTC | 04-24-48 | 5 | 1,302 | 18<br>8<br>6<br>6<br>6 |
| SO Ec 5 | -- | GEO A CHRISTY & SON | SAW | 00-00-10 | 2 | 1,011 | -- |
| SO Ec 6 | SO-00-1652 | MASSEY CHEV SALES | CUSICK | 08-06-47 | 5 | 81 | 1.5 |
| SO Ec 7 | SO-00-5379 | PI&CS | SAW | 05-12-50 | 2 | 1,042 | 8<br>6<br>5 |
| SO Ec 8 | -- | PI&CS | SAW | 1895 | 2 | 1,018 | 8 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 8 | 95 | 122PCMK | 12 | 00-00-82 | 5 | -- | 1 | -- | I | SO Df 24 |
| 35 | 4 | 100 | 122PCMK | 10 | 04-07-81 | 5 | 50 | 2.5 | 10 | I | SO Df 25 |
| 40 | 4 | 100 | 122PCMK | 10 | 04-06-81 | 5 | 50 | 2 | 10 | I | SO Df 26 |
| | | | | 6.6m | 04-15-87 | | | | | | |
| 70 | 2 | 80 | 122PCMK | 10 | 04-16-85 | 3 | 10 | 1 | 3.3 | H | SO Df 27 |
| +1- 120 | | | | 20 | 06-21-86 | 15 | 30 | 1 | 2.0 | C | SO Df 28 |
| 120- 200 | 2 | 200- 240 | 122MNKN | | | | | | | | |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | N | SO Dg 1 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | N | SO Dg 2 |
| 0- 80 | 6 | 80- 95 | 122PCMK | 15 | 03-15-66 | 59 | 205 | 24 | 3.5 | N | SO Dg 4 |
| 95- 100 | 6 | 100- 110 | 122PCMK | | | | | | | | |
| 110- 116 | 6 | 116- 126 | 122PCMK | | | | | | | | |
| 126- 129 | | | | | | | | | | | |
| - 180 | 2 | 200 | 122MNKN | 18 | 08-08-73 | 30 | 30 | 4 | 1.0 | C | SO Dg 5 |
| 75 | 4 | 85 | 122PCMK | 18 | 07-26-73 | 7 | 20 | 4 | 2.9 | C | SO Dg 6 |
| 88 | 2 | 100 | 122PCMK | 9 | 07-17-73 | 3 | 10 | 3 | 3.3 | Z | SO Dg 7 |
| 70 | 2 | 78 | 122PCMK | 8 | 02-03-67 | -- | 10 | 2 | -- | C | SO Dg 8 |
| 89 | 2 | 98 | 122PCMK | 5 | 07-22-66 | -- | 18 | 2 | -- | C | SO Dg 9 |
| 195 | 2 | 220 | 122MNKN | 8 | 04-14-86 | 1 | 35 | 1 | 35 | H | SO Dg 10 |
| 0- 60 | | | | +1.3f | 09-20-45 | -- | 10 | -- | -- | P | SO Ea 1 |
| 0- 567 | | | | | | | | | | | |
| 567- 830 | -- | -- | 217PTMC | | | | | | | | |
| 0- 60 | | | | +12f | 11-17-53 | -- | -- | -- | -- | P | SO Ea 2 |
| 0- 567 | | | | | | | | | | | |
| 567- 819 | 1 | 567- 840 | 217PTMC | | | | | | | | |
| 0- 576 | | | | +15f | 11-17-53 | -- | -- | -- | -- | P | SO Ea 3 |
| 576- 837 | | | 217PTMC | | | | | | | | |
| 0- 567 | | | | f | 02-09-46 | -- | -- | -- | -- | P | SO Ea 4 |
| 567- 830 | 1.5 | 830- 850 | 217PTMC | | | | | | | | |
| 0- 567 | | | | f | 03-27-46 | -- | -- | -- | -- | P | SO Ea 5 |
| 567- 830 | 1.5 | 830- 850 | 217PTMC | | | | | | | | |
| 0- 567 | | | | +15f | 11-17-53 | -- | -- | -- | -- | P | SO Ea 6 |
| 567- 800 | 1.5 | 800- 860 | 217PTMC | | | | | | | | |
| 0- 588 | | | | +15f | 11-17-53 | -- | 25 | 1 | -- | P | SO Ea 7 |
| 588- 808 | | | 217PTMC | | | | | | | | |
| 0- 567 | | | | +15f | 11-17-53 | -- | 25 | 1 | -- | P | SO Ea 8 |
| 567- 840 | | | 217PTMC | | | | | | | | |
| 0- 638 | | | | +20 | 11-17-53 | -- | 15 | -- | -- | P | SO Ea 9 |
| 638- 889 | 1 | 889- 915 | 217PTMC | | | | | | | | |
| 7.2 | -- | -- | 112PCPC | 3.9m | 11-17-53 | -- | -- | -- | -- | H | SO Ea 10 |
| 990 | -- | 1,010 | 217PTMC | +8 | 03-17-70 | 8 | 20 | 2 | 2.5 | H | SO Ea 11 |
| 920 | -- | 940 | 217PTMC | +3 | 03-12-70 | 3 | 50 | 2 | 16 | H | SO Ea 12 |
| 900 | 4 | 922 | 217PTMC | f | 11-15-71 | -- | 25 | 40 | -- | P | SO Ea 13 |
| 0- 245 | | | | 3 | 12-00-37 | 54 | 100 | -- | 1.9 | P | SO Ec 1 |
| 245- 944 | 6 | 944- 994 | 125PLCN | | | | | | | | |
| 0- 245 | | | | f | 00-00-38 | -- | 300 | 24 | -- | P | SO Ec 2 |
| 245- 941 | 6 | 941- 995 | 125PLCN | | | | | | | | |
| 0- 225 | | | | 20 | 00-00-28 | -- | 210 | -- | -- | P | SO Ec 3 |
| 225- 457 | | | | | | | | | | | |
| 457- 950 | | | | | | | | | | | |
| 950-1,042 | 4.5 | 1,042-1,076 | 217PTMC | | | | | | | | |
| 0- 85 | | | | +4 | 04-24-48 | 104 | 300 | 48 | 2.9 | P | SO Ec 4 |
| 85- 375 | | | | 17.7 | 04-15-87 | | | | | | |
| 375- 726 | 6 | 726- 731 | 124PNPN | | | | | | | | |
| 731- 819 | 6 | 819- 829 | 125PLCN | | | | | | | | |
| 829-1,136 | 6 | 1,136-1,146 | 217PTMC | | | | | | | | |
| -- | -- | -- | 217PTMC | -- | -- | -- | -- | -- | -- | N | SO Ec 5 |
| 46 | -- | 81 | 122PCMK | 3 | 08-06-47 | 3 | 20 | .30 | 6.7 | C | SO Ec 6 |
| 0- 283 | | | | +4 | 05-12-50 | 56 | 200 | 48 | 3.6 | N | SO Ec 7 |
| 283- 951 | | | 217PTMC | | | | | | | | |
| 938-1,002 | 6 | 1,002-1,027 | | | | | | | | | |
| -- | -- | -- | 217PTMC | 10.4m | 01-28-54 | -- | 30 | -- | -- | U | SO Ec 8 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min) ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling; PI&CS = The Packers Ice and Cold Storage Company]

| Local well no. | Permit number | Owner | Contractor | Date well constructed | Altitude of land surface (ft) | Depth drilled (ft) | Diameter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Ec 9 | -- | PI&CS | -- | 1892 | 2 | 1,060 | 8 |
| SO Ec 10 | SO-00-0585 | BOZMAN MOTOR CO | CUSICK | 08-30-46 | 5 | 58 | 1.5 |
| SO Ec 11 | SO-00-2220 | MCCREADY MEM. HOSPITAL | CUSICK | 05-05-48 | 5 | 384 | 2.5<br>1.5 |
| SO Ec 12 | SO-00-0663 | HINMAN, WILMER | WHITE | 04-00-48 | 5 | 150 | 2 |
| SO Ec 13 | SO-00-2482 | EMELY, STEWART | CUSICK | 05-22-48 | 5 | 196 | 1.5 |
| SO Ec 14 | SO-00-2481 | BYRD, WILLIAM R, MRS | CUSICK | 05-17-48 | 5 | 186 | 1.5 |
| SO Ec 15 | SO-00-1920 | WARD, M L | CUSICK | 10-23-47 | 5 | 196 | 1.5 |
| SO Ec 16 | SO-00-7192 | RIGGIN, OTIS J | CUSICK | 12-30-50 | 5 | 188 | 1.5 |
| SO Ec 17 | SO-00-1605 | R LAIRD & E BELL | CUSICK | 07-07-47 | 5 | 198 | 1.5 |
| SO Ec 18 | SO-00-0870 | BYRD, BENNETT | CUSICK | 10-08-46 | 5 | 192 | 2.5<br>1.5 |
| SO Ec 19 | SO-00-0589 | AYRES, PRESTON | CUSICK | 08-17-46 | 5 | 183 | 3.5<br>2.5<br>1.5 |
| SO Ec 20 | SO-00-2568 | PARKS, NELLIE | CUSICK | 05-12-48 | 5 | 193 | 1.5 |
| SO Ec 21 | SO-00-2431 | LOWE, W H, JR | CUSICK | 04-23-48 | 5 | 193 | 1.5 |
| SO Ec 22 | SO-00-0588 | REESE, JAMES B | CUSICK | 06-29-46 | 5 | 189 | 3.5<br>2.5<br>1.5 |
| SO Ec 23 | SO-00-0761 | THORNTON, MILFORD J | CUSICK | 08-28-46 | 5 | 179 | 1.5 |
| SO Ec 24 | SO-00-6099 | OWENS, EDWARD | CUSICK | 06-21-50 | 5 | 195 | 1.5 |
| SO Ec 25 | SO-00-2949 | RYLE, WILLIAM, JR | CUSICK | 08-06-48 | 5 | 211 | 1.5 |
| SO Ec 26 | SO-00-1617 | JONES, WALTER | CUSICK | 07-17-47 | 5 | 214 | 1.5 |
| SO Ec 27 | SO-00-1582 | MCINTOSH, JOHN | CUSICK | 07-01-47 | 5 | 198 | 1.5 |
| SO Ec 28 | SO-00-1609 | LAIRD, CHARLES T | CUSICK | 07-11-47 | 5 | 210 | 1.5 |
| SO Ec 29 | SO-00-4270 | JONES, WALTER | CUSICK | 07-16-49 | 5 | 205 | 1.5 |
| SO Ec 30 | SO-00-2432 | BYRD, MERRILL O SR | CUSICK | 04-08-48 | 5 | 362 | 1.5 |
| SO Ec 31 | SO-00-0664 | DAUGHERTY, C HUBBARD | WHITE | 08-15-46 | 5 | 95.5 | 2 |
| SO Ec 32 | SO-00-3431 | WARD, OTIS | CUSICK | 12-24-48 | 5 | 360 | 1.5 |
| SO Ec 33 | SO-00-2984 | WARD, LEROY | CUSICK | 08-14-48 | 3 | 362 | 1.5 |
| SO Ec 34 | SO-00-2350 | MORGAN, WILLIAM | CUSICK | 05-27-48 | 5 | 151 | 1.5 |
| SO Ec 35 | SO-00-2747 | MOSHER, EARL J | CUSICK | 06-05-48 | 5 | 152 | 1.5 |
| SO Ec 36 | SO-00-2705 | DIZE, EARL H | CUSICK | 05-29-48 | 5 | 152 | 1.5 |
| SO Ec 37 | -- | STANT, ALVIN | -- | 00-00-49 | 5 | 62.5 | 1.5 |
| SO Ec 38 | -- | HENDERSON, EARL | -- | 00-00-27 | 5 | 4.25 | 30 |
| SO Ec 39 | -- | MORGAN, BARNEY | -- | 00-00-32 | 5 | 7.5 | 30 |
| SO Ec 40 | -- | CULLEN, LENA M | -- | 1802 | 5 | 8.2 | 30 |
| SO Ec 41 | SO-01-0636 | REVELLE, G BRYCE | CUSICK | 09-16-52 | 5 | 189 | 1.5 |
| SO Ec 42 | SO-04-6301 | CITY OF CRISFIELD | LAYNE ATLNTC | 05-25-62 | 5 | 1,207 | 8<br>8<br>8<br>8<br>8 |
| SO Ec 43 | SO-02-1762 | HIS NIBBS SHIRT CORP | S. SHANNAHAN CO | 06-28-56 | -- | 91 | 6 |
| SO Ec 46 | SO-05-0273 | SEARS, FRANK W | FORD | 01-16-63 | 5 | 133 | 2 |
| SO Ec 47 | -- | CITY OF CRISFIELD | LAYNE-ATLNTC | -- | 5 | 1,113 | -- |
| SO Ec 48 | SO-72-0054 | CITY OF CRISFIELD | LAYNE-ATLNTC | 09-13-72 | 5 | 1,216 | 8<br>8 |
| SO Ec 49 | SO-81-0413 | CITY OF CRISFIELD | SYDNOR HYDRO | 07-21-84 | 5 | 1,365 | 12<br>8<br>8<br>8<br>8<br>8<br>8<br>8 |
| SO Ec 50 | -- | JOHN T HANDY, INC | -- | -- | 5 | -- | -- |
| SO Ec 51 | SO-73-1986 | DRYDEN CAROL CO INC | SWD | 09-22-81 | 5 | 200 | 2 |
| SO Ec 53 | SO-81-0970 | PARKS, RALPH | SWD | 09-16-86 | 5 | 200 | 2 |
| SO Ec 54 | SO-81-0803 | NELSON, DEBRA | SWD | 03-20-86 | 5 | 200 | 2 |
| SO Ec 55 | SO-81-1158 | REVELLE, BRICE | SWD | 08-10-87 | 5 | 200 | 2 |
| SO Ed 1 | SO-00-0163 | MORRIS, RALPH | WHITE | 11-15-45 | 5 | 144 | 2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -- | -- | -- | 217PTMC | +12 | 1892 | -- | 130 | -- | -- | U | SO Ec 9 |
| 43 | -- | 58 | 122PCMK | 5 | 08-30-46 | -- | 20 | 2 | -- | C | SO Ec 10 |
| 0- 340 | -- | | | +1.5 | 05-05-48 | 5.5 | 40 | 8 | 7.3 | U | SO Ec 11 |
| 296- 359 | | 359 - 384 | 122CPNK | | | | | | | | |
| 0- 130.5 | 2 | 130.5- 148.5 | 122MOCN | -- | 04-00-48 | -- | 3 | -- | -- | H | SO Ec 12 |
| 148.5- 150 | | | | | | | | | | | |
| 186 | -- | 196 | 122MNKN | 2 | 05-22-48 | 2 | 25 | 1 | 13 | H | SO Ec 13 |
| 176 | -- | 186 | 122MNKN | -- | -- | 3 | 30 | 1 | 10 | H | SO Ec 14 |
| 186 | -- | 196 | 122MNKN | +1.5 | 10-23-47 | 1.5 | 26 | 2 | 17 | H | SO Ec 15 |
| 178 | -- | 188 | 122MNKN | .5 | 12-30-50 | 5.5 | 28 | 2 | 5.1 | H | SO Ec 16 |
| 188 | -- | 198 | 122MNKN | 5 | 07-07-47 | 1.5 | 20 | 2 | 13 | H | SO Ec 17 |
| 0- 120 | | | | 3 | 10-08-46 | .5 | 20 | 2 | 40 | H | SO Ec 18 |
| 120- 182 | -- | 182 - 192 | 122MNKN | | | | | | | | |
| 0- 50 | | | | 1.8 | 08-17-46 | .2 | 10 | 3 | 50 | H | SO Ec 19 |
| 50- 90 | | | | | | | | | | | |
| 90- 170 | -- | 170 - 183 | 122MNKN | | | | | | | | |
| 181 | -- | 193 | 122MNKN | 2 | 05-12-48 | 2 | 25 | 10 | 13 | H | SO Ec 20 |
| 183 | -- | 193 | 122MNKN | 1.2 | 04-23-48 | .8 | 30 | 2 | 38 | H | SO Ec 21 |
| 0- 50 | | | | 2.2 | 06-29-46 | -- | 10 | 2 | -- | H | SO Ec 22 |
| 50- 90 | | | | | | | | | | | |
| 90- 171 | -- | 171 - 189 | 122MNKN | | | | | | | | |
| 169 | -- | 179 | 122MNKN | 4 | 08-28-46 | -- | 20 | 2 | -- | H | SO Ec 23 |
| 185 | -- | 195 | 122MNKN | 1.5 | 06-21-50 | 7.5 | 22 | 2 | 2.9 | H | SO Ec 24 |
| 199 | 1.5 | 211 | 122MNKN | 6 | 08-06-48 | 3 | 25 | 2 | 8.3 | H | SO Ec 25 |
| 189 | -- | 214 | 122MNKN | 4.5 | 07-17-47 | .5 | 20 | 2 | 40 | H | SO Ec 26 |
| 188 | -- | 198 | 122MNKN | 3 | 07-01-47 | 1.5 | 20 | 1 | 13 | H | SO Ec 27 |
| 195 | -- | 210 | 122MNKN | 4 | 07-11-47 | 1.5 | 20 | 2 | 13 | H | SO Ec 28 |
| 180 | -- | 205 | 122MNKN | 2 | 07-16-49 | 6 | 19 | 3 | 3.2 | H | SO Ec 29 |
| 342 | -- | 362 | 122CPNK | 1.3 | 04-08-48 | .7 | 30 | 3 | 43 | H | SO Ec 30 |
| 0- 75.5 | -- | 75.5- 83.5 | 122MOCN | 3 | 08-15-46 | -- | 30 | 2 | -- | U | SO Ec 31 |
| 83.5- 85 | | | | | | | | | | | |
| 340 | 1.5 | 360 | 122CPNK | + .5 | 12-24-48 | 5.5 | 28 | 3 | 5.1 | H | SO Ec 32 |
| 338 | 1.5 | 362 | 122CPNK | +1.2 | 08-14-48 | 3.2 | 30 | 4 | 9.4 | H,S | SO Ec 33 |
| 116 | -- | 151 | 122MOCN | 3 | 05-27-48 | 5 | 10 | 2 | 2.0 | H | SO Ec 34 |
| 112 | 1.5 | 152 | 122MOCN | 3 | 06-05-48 | 12 | 10 | 1 | .83 | H | SO Ec 35 |
| 117 | 1.5 | 152 | 122MOCN | 1 | 05-29-48 | 5 | 10 | 1 | 2.0 | H | SO Ec 36 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H,S | SO Ec 37 |
| -- | -- | -- | 112PCPC | 1.9m | 04-21-52 | -- | -- | -- | -- | U | SO Ec 38 |
| -- | -- | -- | 112PCPC | 2.6m | 04-21-52 | -- | -- | -- | -- | H | SO Ec 39 |
| -- | -- | -- | 112PCPC | 2.2m | 04-21-52 | -- | -- | -- | -- | H | SO Ec 40 |
| 174 | -- | 189 | 122MNKN | 3 | 09-16-52 | 1 | 30 | 2 | 30 | H | SO Ec 41 |
| 0- 915 | 8 | 915 - 930 | 125PLCN | 51.7 | 05-25-62 | 98.3 | 415 | -- | 4.2 | P | SO Ec 42 |
| 930-1,078 | 8 | 1,078 -1,083 | 217PTMC | 1.9m | 04-16-87 | | | | | | |
| 1,083-1,085 | 8 | 1,085 -1,090 | 217PTMC | | | | | | | | |
| 1,090-1,100 | 8 | 1,100 -1,105 | 217PTMC | | | | | | | | |
| 1,105-1,110 | | | | | | | | | | | |
| 80 | 6 | 91 | 122MOCN | 8 | 06-28-56 | 38 | 50 | 10 | 1.3 | N | SO Ec 43 |
| 121 | 2 | 133 | 122MOCN | 5 | 01-16-63 | -- | 14 | 2 | -- | H | SO Ec 46 |
| -- | -- | -- | 217PTMC | -- | -- | -- | -- | -- | -- | U | SO Ec 47 |
| 0-1,121 | 8 | 1,121 -1,156 | 217PTMC | 20 | 09-29-72 | 71 | 500 | 9 | 7.0 | P | SO Ec 48 |
| 1,156-1,161 | | | | | | | | | | | |
| 0- 916 | | | | 10 | 07-21-84 | 235 | 800 | 24 | 3.4 | P | SO Ec 49 |
| 916- 922 | 8 | 922 - 952 | 125PLCN | | | | | | | | |
| 952- 970 | 8 | 970 - 976 | 125PLCN | | | | | | | | |
| 976-1,090 | 8 | 1,090 -1,096 | 217PTMC | | | | | | | | |
| 1,096-1,112 | 8 | 1,112 -1,130 | 217PTMC | | | | | | | | |
| 1,130-1,249 | 8 | 1,249 -1,269 | 217PTMC | | | | | | | | |
| 1,269-1,295 | 8 | 1,295 -1,307 | 217PTMC | | | | | | | | |
| 1,307-1,312 | 8 | 1,312 -1,320 | 217PTMC | | | | | | | | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | C | SO Ec 50 |
| 170 | 2 | 200 | 122MNKN | 10 | 09-22-81 | 2 | 10 | 1 | 5.0 | C | SO Ec 51 |
| 180 | 2 | 200 | 122MNKN | -- | 09-16-86 | 1 | 50 | 1 | 50 | H | SO Ec 53 |
| 180 | 2 | 200 | 122MNKN | 8 | 03-20-86 | 2 | 40 | 1 | 20 | H | SO Ec 54 |
| 180 | 2 | 200 | 122MNKN | 3 | 08-10-87 | 1 | 60 | 1 | 60 | H | SO Ec 55 |
| 134 | 2 | 144 | 122MOCN | 3 | 11-15-45 | -- | 20 | 3 | -- | H,S | SO Ed 1 |

TABLE 14
RECORDS OF WELLS IN SOMERSET COUNTY—Continued

[ft = foot; in. = inch; gal/min = gallons per minute; (gal/min)/ft = gallons per minute per foot; -- = no data; m = measured; + = above land surface; SWD = Somerset Well Drilling]

| Local well no. | Permit number | Owner | Contractor | Date well con- structed | Alti- tude of land sur- face (ft) | Depth drilled (ft) | Diam- eter of casing (in.) |
|---|---|---|---|---|---|---|---|
| SO Ed 2 | SO-00-0800 | COX, WILLIAM S | CUSICK | 09-12-46 | 5 | 210 | 1.5 |
| SO Ed 3 | SO-00-7920 | CHAS D BRIDDELL INC | LAYNE-ATLNTC | 05-28-51 | 5 | 70 | 6 |
| SO Ed 4 | SO-00-7644 | MCCREADY, DORA | CUSICK | 04-21-51 | 5 | 398 | 1.5 |
| SO Ed 5 | SO-00-7503 | STERLING, CLEMENT R | CUSICK | 04-06-51 | 5 | 202 | 1.5 |
| SO Ed 6 | SO-00-0817 | STERLING, L T | CUSICK | 09-18-46 | 5 | 64 | 2 |
| SO Ed 7 | SO-00-8216 | SOMERS, MELISSA | CUSICK | 07-14-51 | 5 | 210 | 1.5 |
| SO Ed 8 | SO-00-7556 | SALTZ, S M | CUSICK | 04-11-51 | 5 | 198 | 1.5 |
| SO Ed 9 | SO-00-6380 | BRADSHAW, RICHARD | CUSICK | 08-08-50 | 5 | 211 | 1.5 |
| SO Ed 10 | SO-00-5628 | STEPHENS, JAMES F MRS | CUSICK | 04-19-50 | 5 | 212 | 1.5 |
| SO Ed 11 | SO-00-3478 | SALTZ, SAM | CUSICK | 12-06-48 | 5 | 215 | 1.5 |
| SO Ed 12 | SO-00-4843 | THORTON, JAMES | CUSICK | 10-08-49 | 5 | 198 | 1.5 |
| SO Ed 13 | SO-00-2065 | DIZE, SHERMAN | CUSICK | 11-15-47 | 5 | 200 | 1.5 |
| SO Ed 14 | SO-00-2005 | CULLEN, GEORGE T, JR | CUSICK | 10-29-47 | 5 | 195 | 1.5 |
| SO Ed 15 | SO-00-0366 | NELSON, ALONZO | CUSICK | 05-25-46 | 5 | 189 | 3.5<br>2.5<br>1.5 |
| SO Ed 16 | SO-00-7555 | STERLING, SILAS MRS | CUSICK | 04-16-51 | 5 | 193 | 1.5 |
| SO Ed 17 | SO-00-0482 | JUSTICE, MAUDE | CUSICK | 06-02-46 | 5 | 188 | 3.5<br>2.5<br>1.5 |
| SO Ed 18 | SO-00-0481 | STERLING, JACKSON | CUSICK | 05-30-46 | 5 | 190 | 3.5<br>2.5<br>1.5 |
| SO Ed 19 | SO-00-5685 | TODD, WILLIS | CUSICK | 05-04-50 | 5 | 196 | 1.5 |
| SO Ed 20 | SO-00-6231 | TYLER, FRED | CUSICK | 08-02-50 | 5 | 191 | 1.5 |
| SO Ed 21 | SO-00-0742 | MADDOX, N | CUSICK | 09-24-46 | 5 | 194 | 1.5 |
| SO Ed 22 | SO-00-3595 | BLADES, ALVIN | CUSICK | 03-01-49 | 5 | 204 | 1.5 |
| SO Ed 23 | SO-00-3134 | MADDRIX, PAUL E | CUSICK | 11-20-48 | 5 | 188 | 1.5 |
| SO Ed 24 | -- | NELSON, ALONZO K | CUSICK | 11-00-51 | 5 | 197 | 1.5 |
| SO Ed 25 | SO-00-1581 | MASSEY, CARLTON | CUSICK | 06-28-47 | 5 | 198 | 1.5 |
| SO Ed 26 | SO-00-0743 | HINMAN, HOWARD | CUSICK | 08-21-46 | 5 | 187 | 1.5 |
| SO Ed 27 | SO-00-2003 | STERLING, BURNS | CUSICK | 10-25-47 | 5 | 195 | 1.5 |
| SO Ed 28 | SO-00-4110 | ENNIS, ARZAH R | CUSICK | 06-10-49 | 5 | 208 | 1.5 |
| SO Ed 29 | SO-00-3791 | CRISFIELD COUNTRY CLUB | CUSICK | 04-14-49 | 5 | 200 | 1.5 |
| SO Ed 30 | SO-00-4842 | TAWES, WELLINGTON | CUSICK | 10-12-49 | 5 | 200 | 1.5 |
| SO Ed 31 | SO-00-4876 | STERLING, ELIJAH | CUSICK | 10-15-49 | 5 | 210 | 1.5 |
| SO Ed 32 | SO-00-2499 | PRICE, HOWARD | WHITE | 07-20-48 | 5 | 54 | 2 |
| SO Ed 33 | -- | DIZE, V | -- | -- | 5 | 6.8 | 1.5 |
| SO Ed 34 | -- | MARINERS CHURCH | -- | 00-00-17 | 5 | 6.85 | 28 |
| SO Ed 35 | -- | HICKMAN, ERNEST | -- | -- | 5 | -- | -- |
| SO Ed 36 | -- | BEDSWORTH, HENRY | -- | 1877 | 5 | 86.1 | 2.3 |
| SO Ed 37 | -- | PRUITT, WILLIAM | -- | 1892 | 5 | 10.6 | 1.8 |
| SO Ed 38 | -- | WARD, IONA | -- | -- | 5 | 7.7 | 2 |
| SO Ed 39 | -- | MORGAN, HETTIE | -- | 00-00-22 | 5 | 9.4 | 2.5 |
| SO Ed 40 | -- | STERLING, KENNETH | CUSICK | 03-00-51 | 5 | 203 | 1.25 |
| SO Ed 41 | SO-01-0637 | WARD, WELLINGTON | CUSICK | 08-18-52 | 5 | 201 | 1.5 |
| SO Ed 42 | SO-73-0286 | CHRISTIAN HOLINESS CH | FORD | 07-26-74 | 5 | 200 | 2 |
| SO Ed 43 | -- | LAWSON, ALFRED | -- | -- | 5 | -- | -- |
| SO Ed 44 | SO-73-0483 | SOMERSET CO. RECR/PARKS | FORD | 06-20-75 | 10 | 75 | 2 |
| SO Ed 45 | SO-81-0090 | ROACH, MELVIN | SWD | 06-28-82 | 5 | 210 | 2 |
| SO Ed 46 | SO-81-1020 | U.S. GEOLOGICAL SURVEY | SWD | 01-05-87 | 5 | 8 | 2 |
| SO Ed 47 | SO-81-0917 | TYLER, WILLIAM | SWD | 07-15-86 | 5 | 210 | 4<br>2 |
| SO Ed 48 | SO-81-0765 | MILLINER, TIMOTHY | SWD | 12-04-85 | 5 | 205 | 2 |
| SO Ed 49 | SO-81-0941 | RIGGIN, EARL | SWD | 07-29-86 | 5 | 205 | 2 |
| SO Ea 1 | SO-00-0854 | HANDY, JOHN T | CUSICK | 10-16-46 | 5 | 92 | 1.5 |
| SO Ee 2 | -- | HALL, S | -- | -- | 5 | 8.7 | 1.5 |
| SO Ef 1 | SO-00-6830 | HOWARD, H M | WHITE | 10-00-50 | 5 | 73 | 2 |
| SO Ef 2 | -- | MILBOURNE, J E | -- | -- | 5 | 12.5 | 24 |
| SO Ef 3 | -- | MORRELL, G O | -- | 00-00-32 | 5 | 95 | 1.25 |
| SO Ef 4 | -- | GRAY, S | GRAY | 00-00-51 | 10 | 15 | 1.25 |
| SO Ef 5 | SO-67-0079 | MADDOX, FRED | FORD | 11-24-66 | 5 | 104 | 2 |
| SO Ef 6 | SO-73-0764 | YOUNG, GEORGE E, JR | KAUFFMAN | 08-04-76 | 10 | 120 | 4<br>2 |

| Bottom of casing or cased interval (ft) | Diameter of screen (in.) | Bottom of screen or screened interval (ft) | Aquifer code | Water level (ft) | Date water level measured | Drawdown (ft) | Discharge (gal/min) | Pumping period (hours) | Specific capacity [(gal/min)/ft] | Use of water | Local well no. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | -- | 210 | 122MNKN | 4 | 09-12-46 | .5 | 25 | 2 | 50 | H,S | SO Ed 2 |
| 60 | 6 | 70 | 122MNKN | 3.7 | 05-28-51 | 8.3 | 100 | 48 | 12 | N | SO Ed 3 |
| 378 | -- | 398 | 122CPNK | 0 | 04-21-51 | 3 | 30 | 3 | 10 | H | SO Ed 4 |
| 182 | 1.5 | 202 | 122MNKN | 2 | 04-06-51 | 12 | 10 | 3 | .83 | H | SO Ed 5 |
| 56 | -- | 64 | 122PCMK | 3 | 09-18-46 | .5 | 15 | 2 | 30 | H,S | SO Ed 6 |
| 190 | -- | 210 | 122MNKN | 4 | 07-14-51 | 5 | 16 | 3 | 3.2 | H | SO Ed 7 |
| 178 | -- | 198 | 122MNKN | 1.5 | 04-11-51 | 7.5 | 15 | 2 | 2.0 | H | SO Ed 8 |
| 182 | -- | 211 | 122MNKN | 6 | 08-08-50 | 6 | 8 | 2 | 1.3 | H | SO Ed 9 |
| 192 | -- | 212 | 122MNKN | 2 | 04-19-50 | 6 | 25 | 2 | 4.2 | H | SO Ed 10 |
| 189 | -- | 214 | 122MNKN | 2 | 12-06-48 | 3 | 15 | 3 | 5.0 | H | SO Ed 11 |
| 188 | -- | 198 | 122MNKN | 3 | 10-08-49 | 13 | 35 | 3 | 2.7 | H | SO Ed 12 |
| 185 | -- | 200 | 122MNKN | .5 | 11-15-47 | 2.5 | 20 | 2 | 8.0 | H | SO Ed 13 |
| 185 | -- | 195 | 122MNKN | 1.5 | 10-29-47 | 3.5 | 25 | 2 | 7.1 | H | SO Ed 14 |
| 0- 50 | | | | 1.8 | 05-25-46 | .4 | 25 | 1 | 63 | H | SO Ed 15 |
| 50- 90 | | | | | | | | | | | |
| 90- 179 | 1.5 | 179 - 189 | 122MNKN | | | | | | | | |
| 183 | -- | 193 | 122MNKN | 2 | 04-16-51 | 5 | 30 | 2 | 6.0 | H | SO Ed 16 |
| 0- 50 | | | | 1.8 | 06-02-46 | .4 | 25 | 1 | 63 | H | SO Ed 17 |
| 50- 90 | | | | | | | | | | | |
| 90- 178 | 1.5 | 178 - 188 | 122MNKN | | | | | | | | |
| 0- 50 | | | | .2 | 05-30-46 | 2 | 25 | 1 | 12.5 | H | SO Ed 18 |
| 50- 90 | | | | | | | | | | | |
| 90- 180 | | 180 - 190 | 122MNKN | | | | | | | | |
| 186 | -- | 196 | 122MNKN | 1.5 | 05-04-50 | 1.5 | 28 | 2 | 19 | H | SO Ed 19 |
| 181 | 1.5 | 191 | 122MNKN | 2 | 08-02-50 | 7 | 20 | 3 | 2.9 | H | SO Ed 20 |
| 184 | -- | 194 | 122MNKN | 2.5 | 09-24-46 | .5 | 20 | 1 | 40 | H | SO Ed 21 |
| 194 | 1.5 | 204 | 122MNKN | 1.5 | 03-01-49 | 1.5 | 25 | 2 | 7 | H | SO Ed 22 |
| 156 | -- | -- | 122MNKN | .5 | 11-20-48 | 2.5 | 22 | 5 | 8.8 | C | SO Ed 23 |
| 187 | -- | 197 | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Ed 24 |
| 188 | -- | 198 | 122MNKN | 1 | 06-28-47 | 1.5 | 22 | 2 | 15 | H | SO Ed 25 |
| 175 | -- | 187 | 122MNKN | 2.5 | 08-21-46 | -- | -- | -- | -- | H | SO Ed 26 |
| 185 | -- | 195 | 122MNKN | 1.7 | 10-25-47 | 1.3 | 25 | 1 | 19 | C | SO Ed 27 |
| 188 | 1.5 | 208 | 122MNKN | 3 | 06-10-49 | 4 | 22 | 2 | 5.5 | H,S | SO Ed 28 |
| 188 | 1.5 | 200 | 122MNKN | 0 | 04-14-49 | 4 | 25 | 2 | 6.2 | H | SO Ed 29 |
| 185 | -- | 200 | 122MNKN | 4 | 10-12-49 | 21 | 22 | 2 | 1.1 | S | SO Ed 30 |
| 190 | | 210 | 122MNKN | 2 | 10-15-49 | 28 | 20 | 4 | .71 | H | SO Ed 31 |
| 40.5 | -- | 52.5 | 122PCMK | 5 | 07-20-48 | -- | 10 | 1 | -- | U | SO Ed 32 |
| -- | -- | -- | 112PCPC | .4m | 03-25-52 | -- | -- | -- | -- | H,S | SO Ed 33 |
| -- | -- | -- | 112PCPC | 2.0m | 04-21-52 | -- | -- | -- | -- | H | SO Ed 34 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H | SO Ed 35 |
| -- | -- | -- | 122PCMK | 2.6m | 04-21-52 | -- | -- | -- | -- | H,S | SO Ed 36 |
| -- | -- | -- | 112PCPC | 3.3m | 04-21-52 | -- | -- | -- | -- | H | SO Ed 37 |
| -- | -- | -- | 112PCPC | 2.4m | 04-21-52 | -- | -- | -- | -- | H | SO Ed 38 |
| -- | -- | -- | 112PCPC | 2.8m | 04-21-52 | -- | -- | -- | -- | H | SO Ed 39 |
| 191 | -- | 203 | 122MNKN | -- | -- | -- | -- | -- | -- | H | SO Ed 40 |
| 186 | -- | 201 | 122MNKN | 5 | 08-18-52 | 2 | 25 | 2 | 13 | H | SO Ed 41 |
| 185 | 2 | 200 | 122MNKN | 6 | 07-26-74 | 2 | 10 | 3 | 5.0 | N | SO Ed 42 |
| -- | -- | -- | 122MNKN | -- | -- | -- | -- | -- | -- | -- | SO Ed 43 |
| 55 | 2 | 75 | 122PCMK | 8 | 06-20-75 | 1 | 12 | 3 | 12 | C,N | SO Ed 44 |
| 190 | 2 | 210 | 122MNKN | 10 | 06-28-82 | 2 | 10 | 15 | 5.0 | -- | SO Ed 45 |
| 3 | 2 | 8 | 112PCPC | 1.5m | 04-15-87 | -- | -- | -- | -- | H | SO Ed 46 |
| +1- 100 | | | | 13 | 07-15-86 | 1 | 60 | 1 | 60 | H | SO Ed 47 |
| 100- 185 | 2 | 185 - 210 | 122MNKN | | | | | | | | |
| 175 | 2 | 205 | 122MNKN | 7 | 12-04-85 | 1 | 40 | 1 | 40 | H | SO Ed 48 |
| 185 | 2 | 205 | 112PCPC | 8 | 07-29-86 | 1 | 65 | 1 | 65 | C | SO Ed 49 |
| 82 | -- | 92 | 122PCMK | 3 | 10-16-46 | 1 | 18 | 1.5 | 18 | S | SO Ee 1 |
| 8.7 | -- | -- | 112PCPC | .6m | 03-26-52 | -- | -- | -- | -- | H | SO Ee 2 |
| 65 | 2 | 73 | 122PCMK | 3 | 10-00-50 | -- | -- | -- | -- | H,S | SO Ef 1 |
| -- | -- | -- | 112PCPC | 1.5m | 03-26-52 | -- | -- | -- | -- | H,S | SO Ef 2 |
| -- | -- | -- | 122PCMK | -- | -- | -- | -- | -- | -- | H,S | SO Ef 3 |
| -- | -- | -- | 112PCPC | -- | -- | -- | -- | -- | -- | H,S | SO Ef 4 |
| 88 | 2 | 104 | 122PCMK | 4 | 11-24-66 | -- | 10 | 2 | -- | C | SO Ef 5 |
| +2- 62 | | | | 4 | 08-04-76 | 15 | 40 | 2 | 2.7 | H | SO Ef 6 |
| 62- 91 | 2 | 91 - 101 | 122PCMK | | | | | | | | |

# MAPS SHOWING WELL LOCATIONS

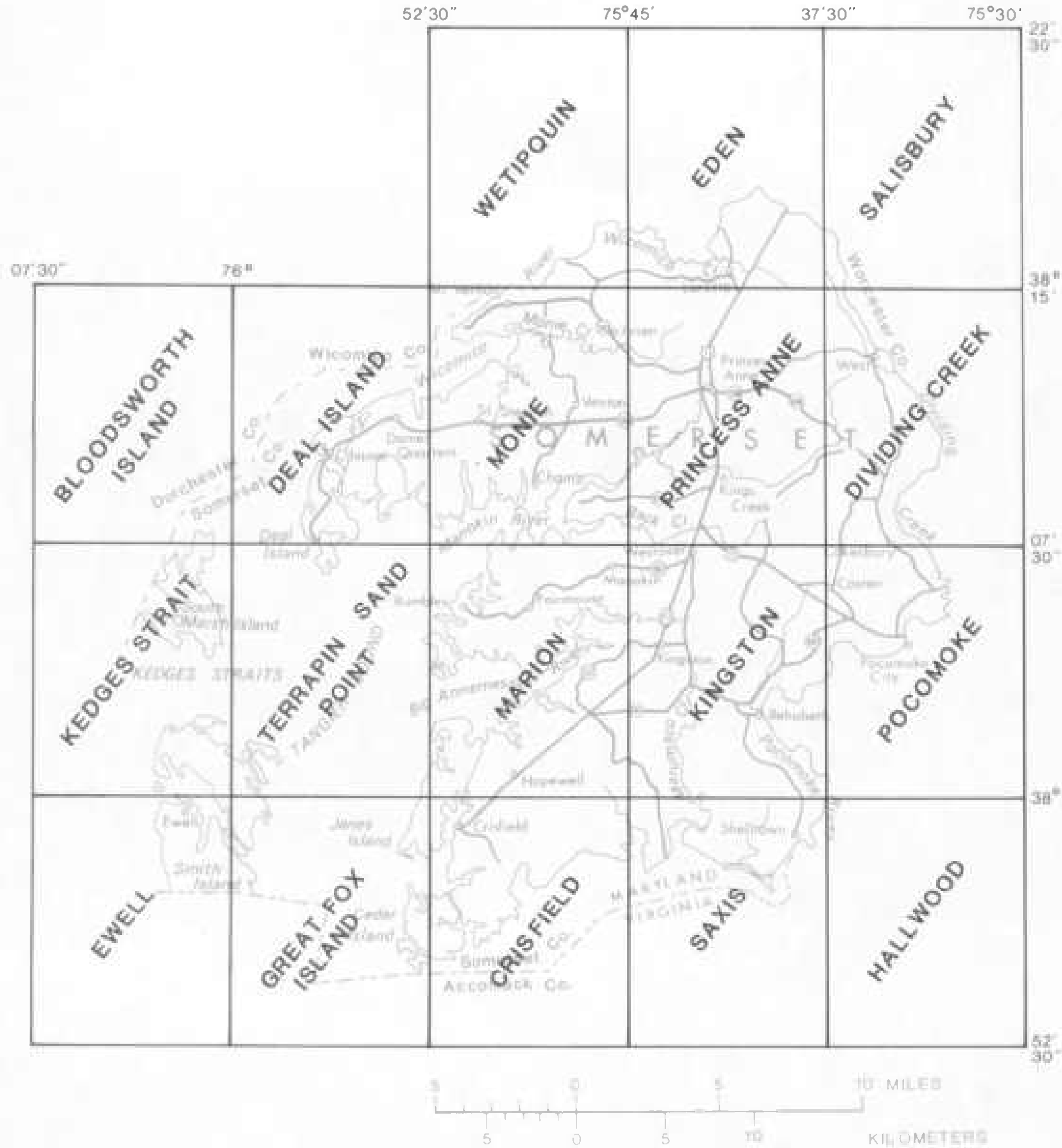



Figure 41.— Index map of 7 1/2-minute quadrangles.

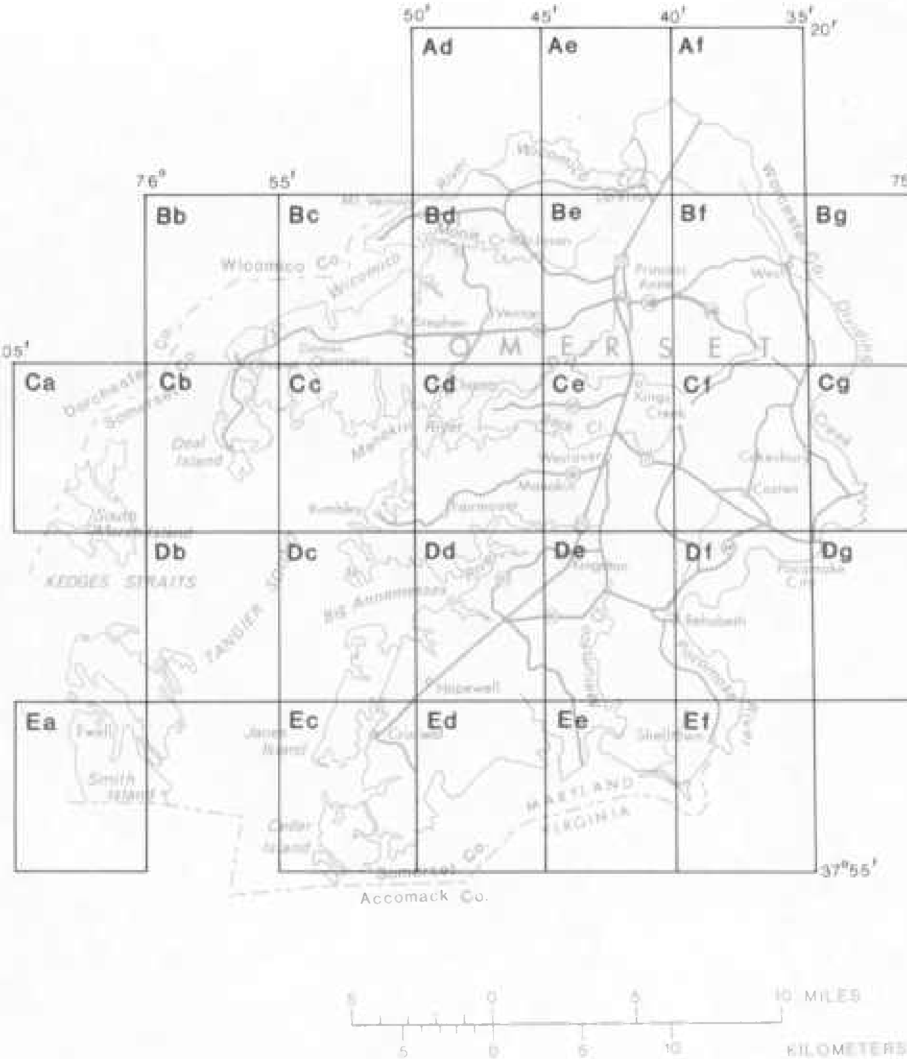
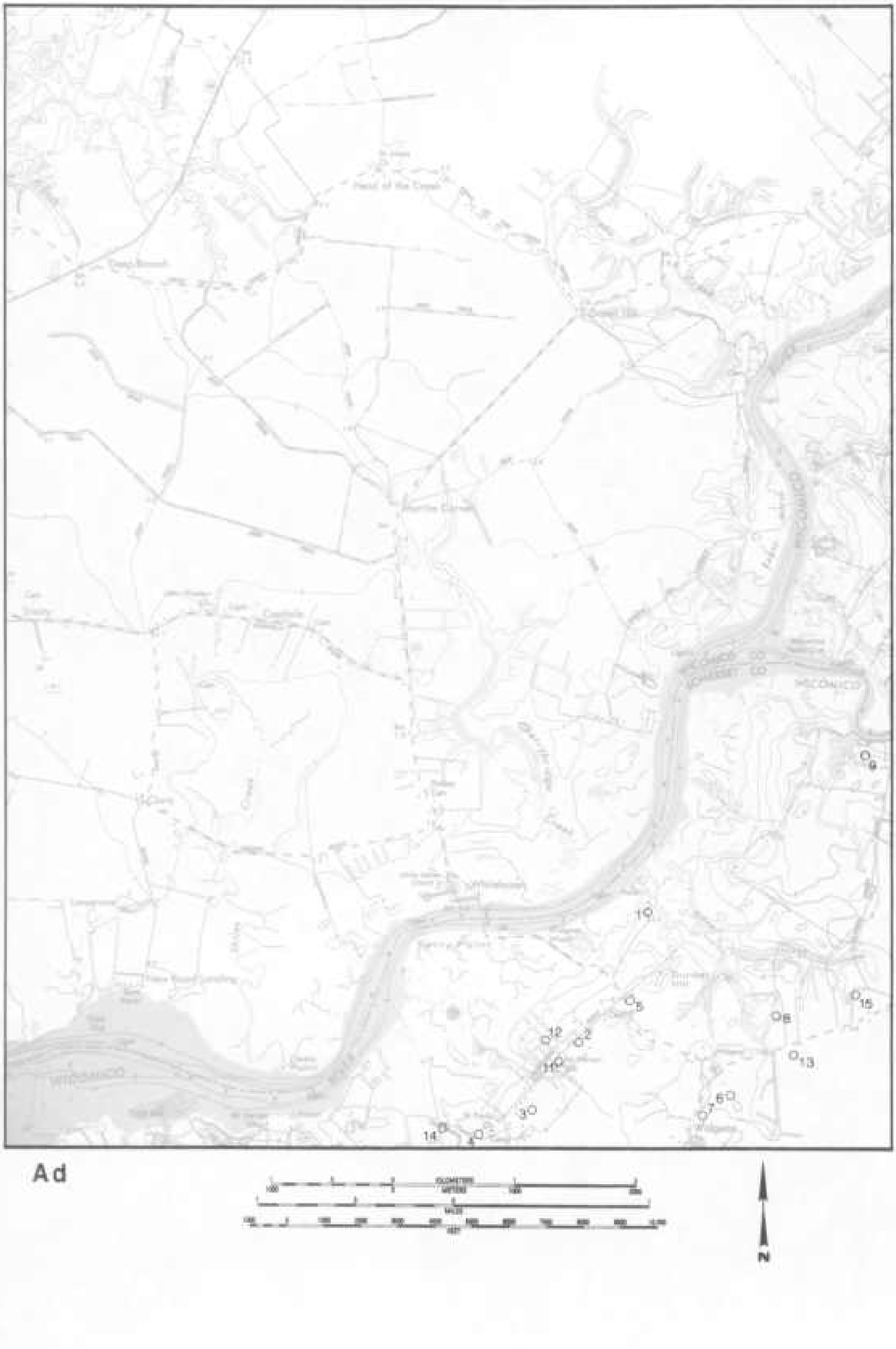



Figure 42.— Index map of 5-minute quadrangles.

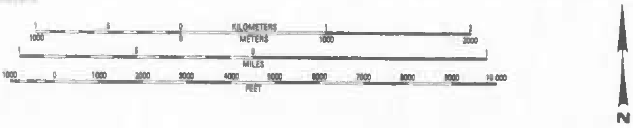



Ad


Ae

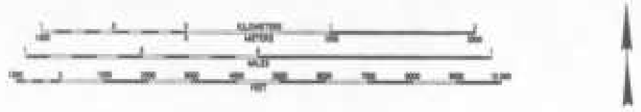

NOTE: The right side of the map is shown in meters

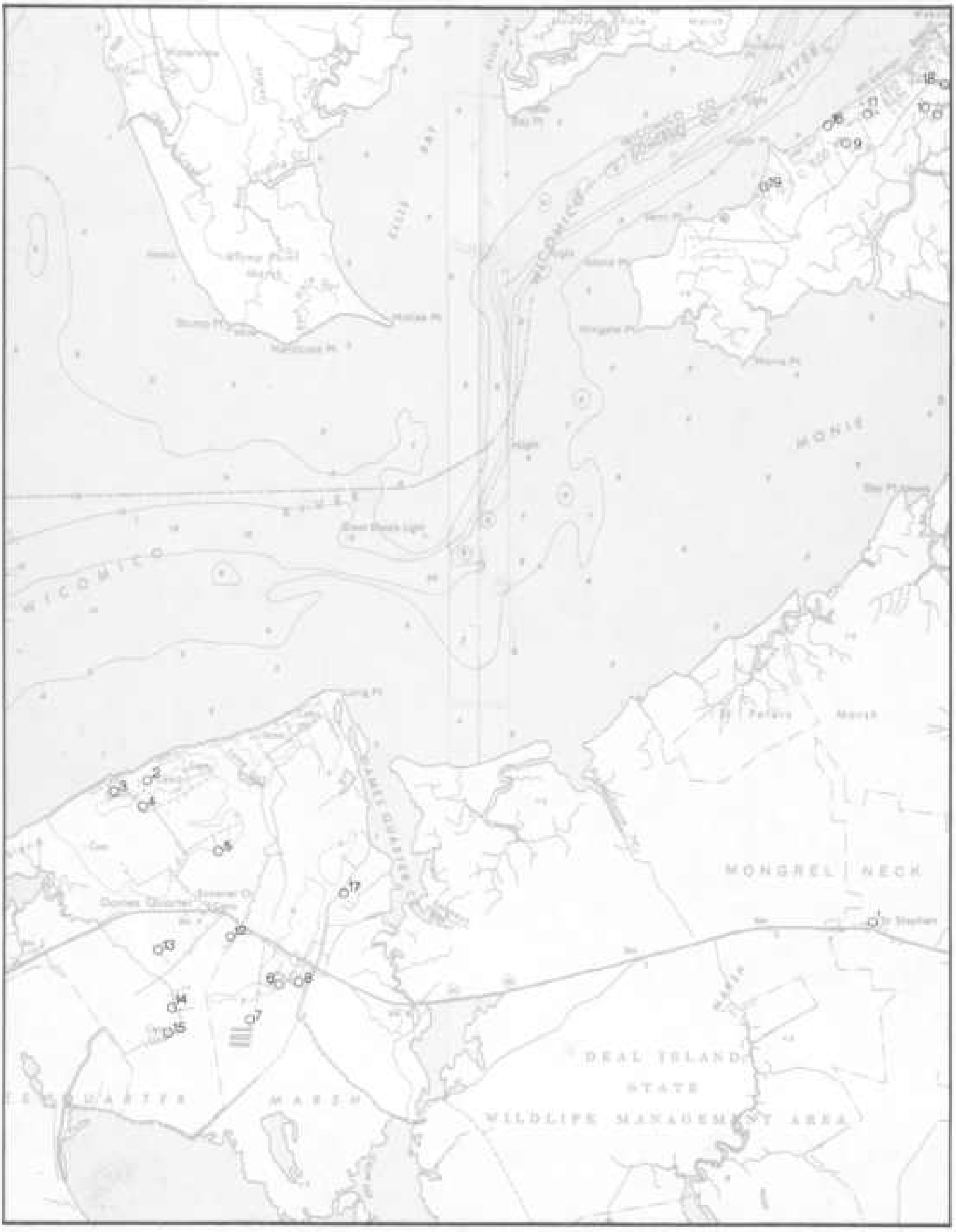
Af



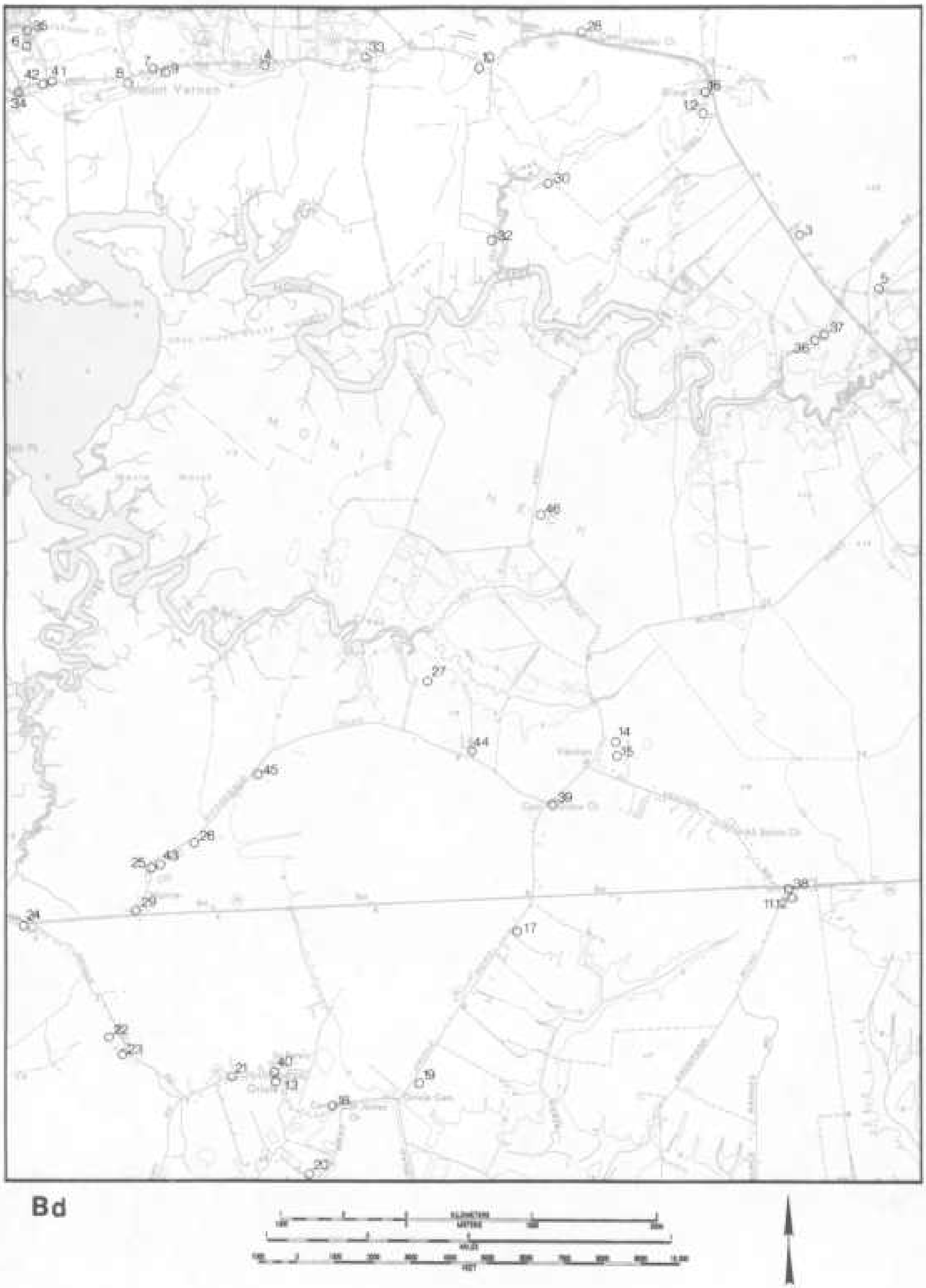

FISHING BAY
Sandy Island
Clay Island
WICOMICO CO
SOMERSET CO
1
2
3
4
5
6
7
8
9
10,18
11
12
13
14
15,17
16,19
20
21
22
23
24

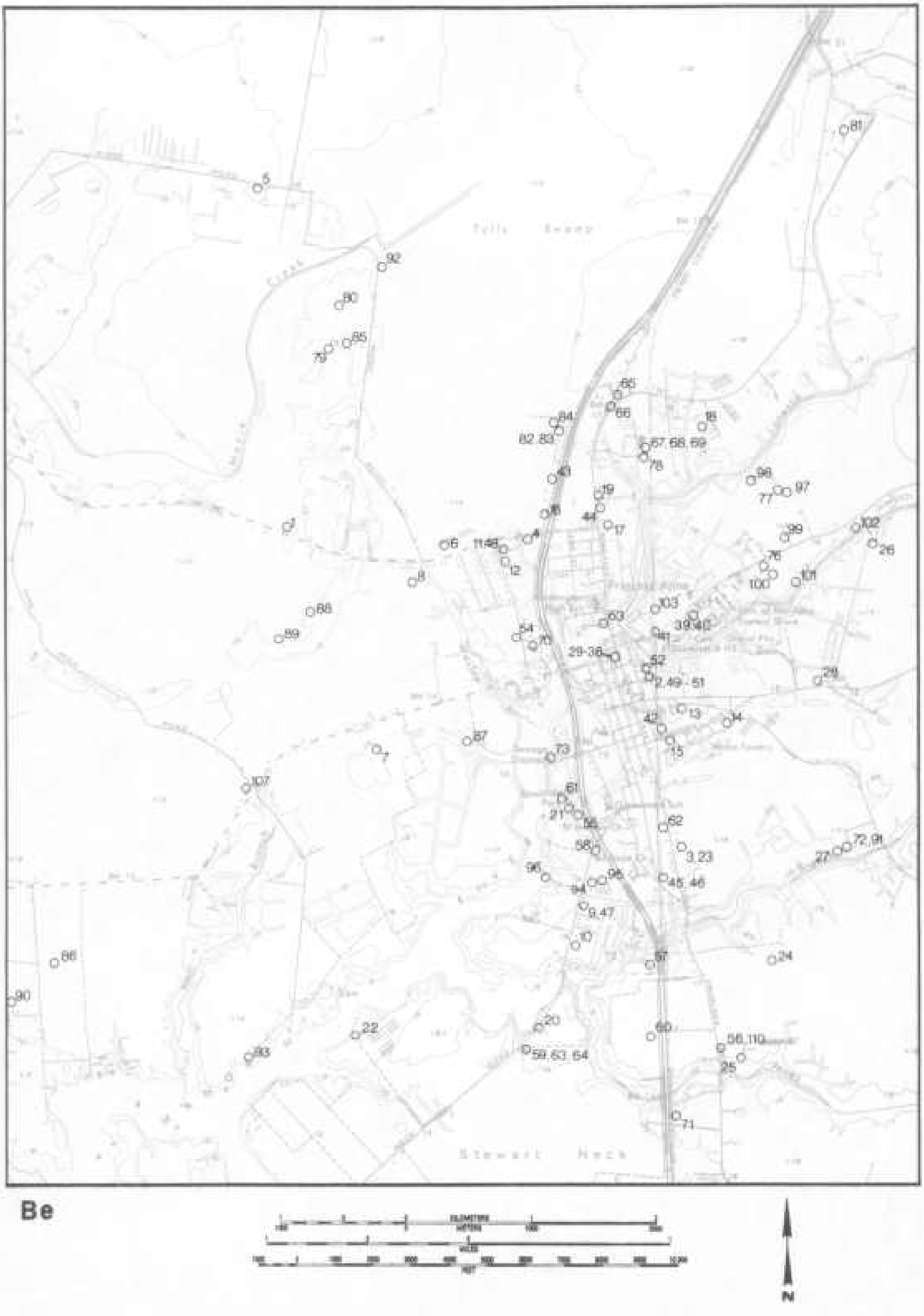
Bb


N


WICOMICO
RIVER
MONIE
MONGREL NECK
DEAL ISLAND
STATE
MARSH
N

Bc


Mount Vernon
Bd



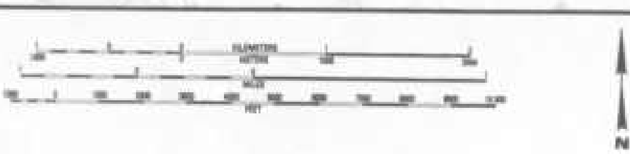
Be


Bf


POCOMOKE
STATE FOREST
5
3
1
2
Bg
N


NORTHEAST COVE
Spring Island
SOUTH MARSH ISLAND
Johnson Cove
Old Ground Marsh

Ca


N


Cb

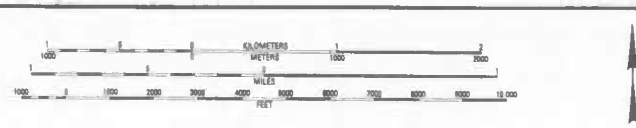

Cc


REVELS NECK
HOLLAND
Upper Hill
Upper Fairmount
1
2
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18,19,20
21
22
23
24
25
26,27,28
29
30
31
32
33
34
35
36
37
38
39
41
42,43
44
45
46
47
48
49
50
51
52
53
54
N

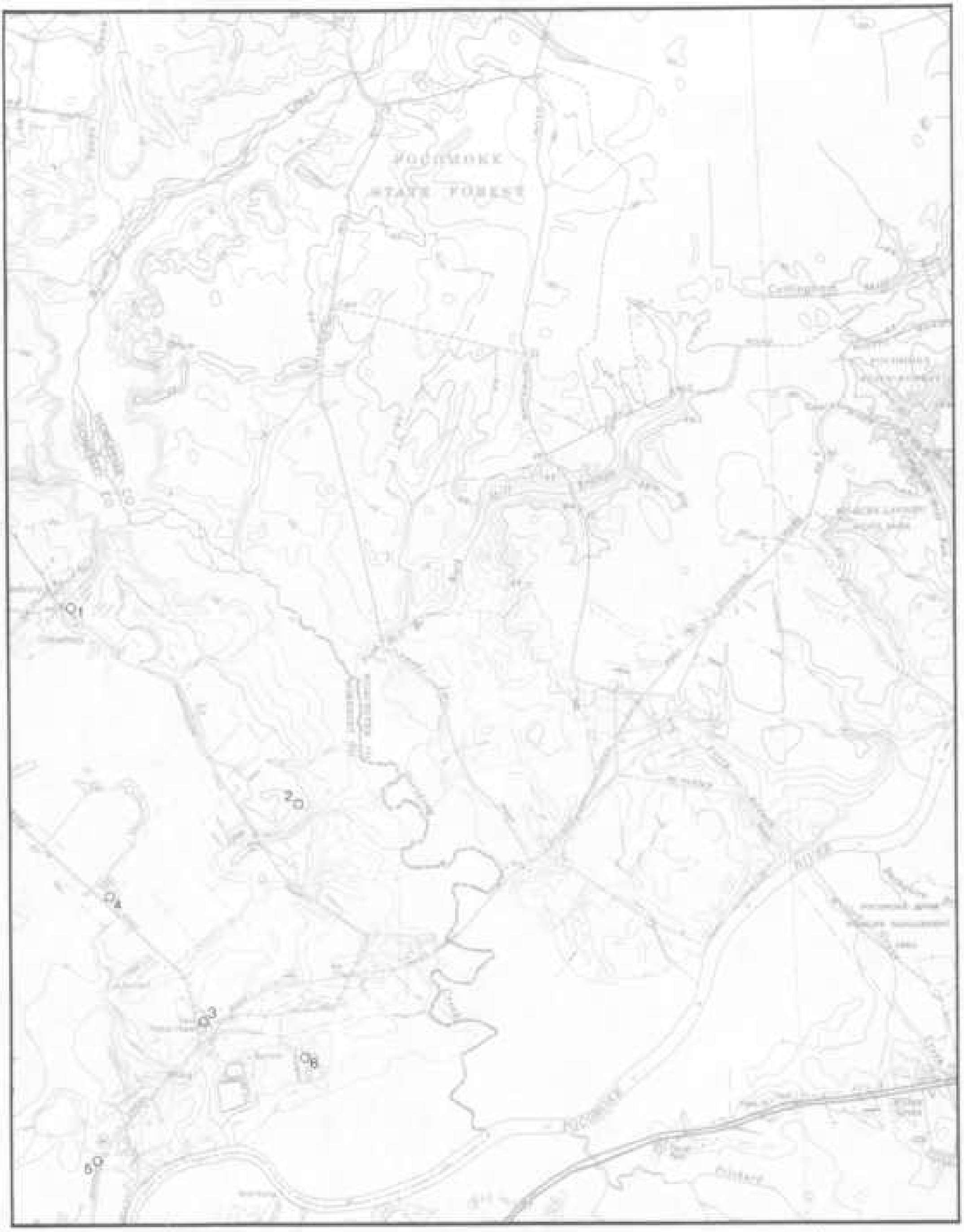
Cd


18
22
38
37
53
47
41,44-46
24
84
42,43
7
51
52
48,49
23
50
85,86
12
16
92
94
87
17
11
25
61
26
20
55,
57
21
39
14,63,65,67
69
1
71,73
2
59
79
75,83
54
82
27
13
15
68
72
78
90
8
58,60,62
28
76
10
80
3
9
56
74
4
5
32
88
66
31
34
19
77
33
70
36
64
29
30
35
6
81

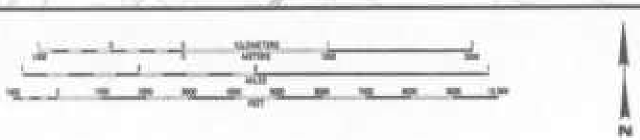
Ce


KILOMETERS
METERS
MILES
FEET
N


Cf

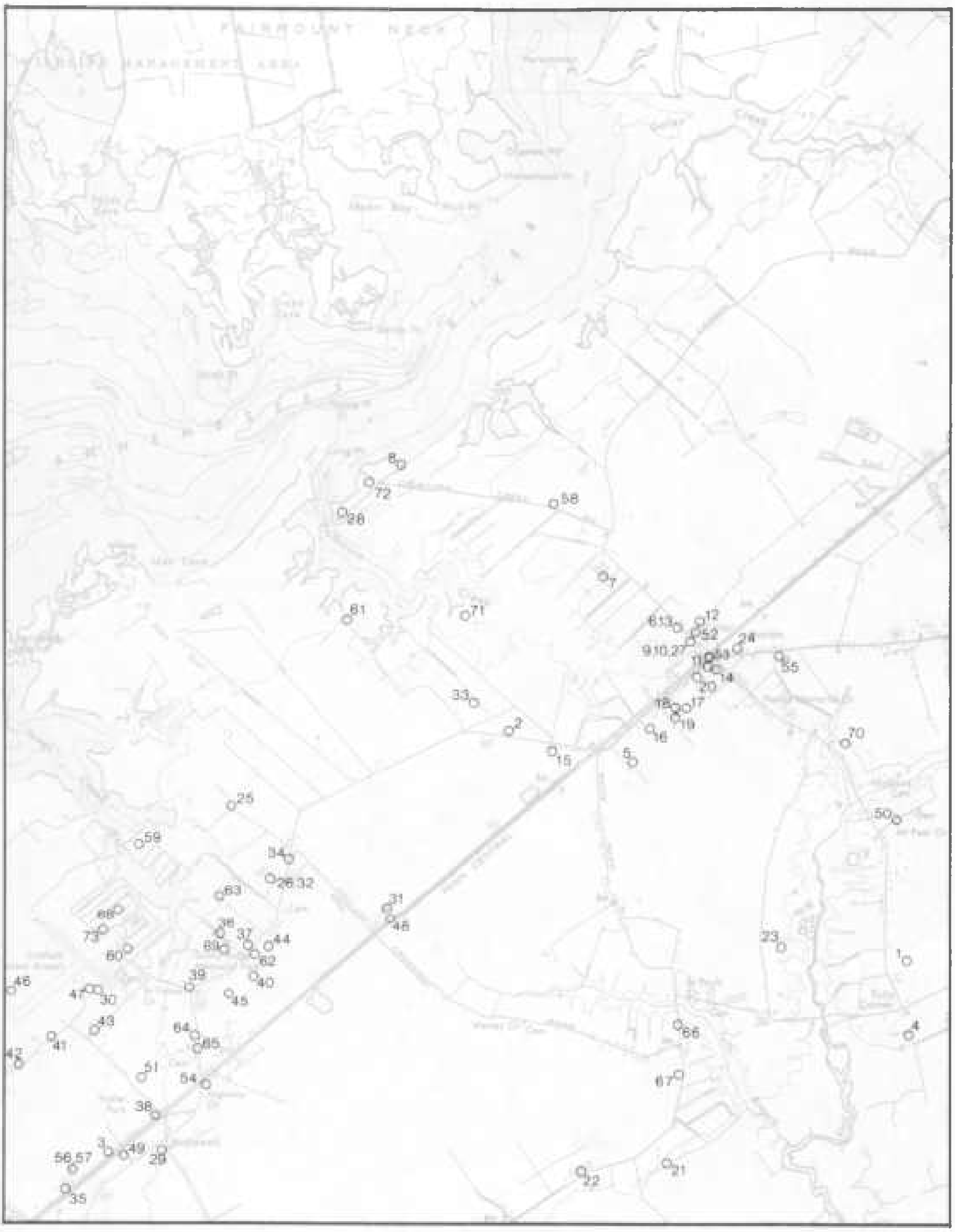



Cg

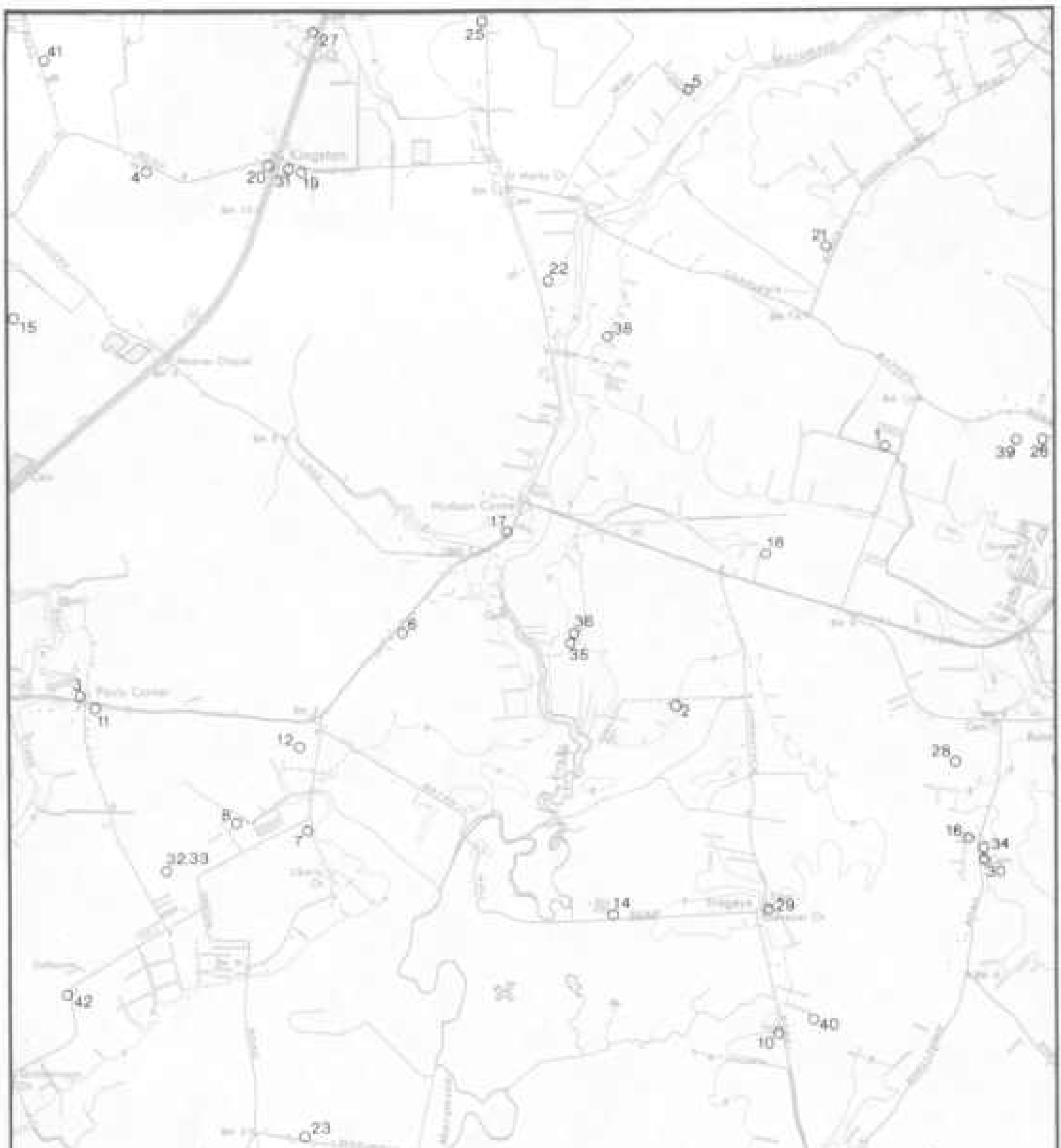



Db

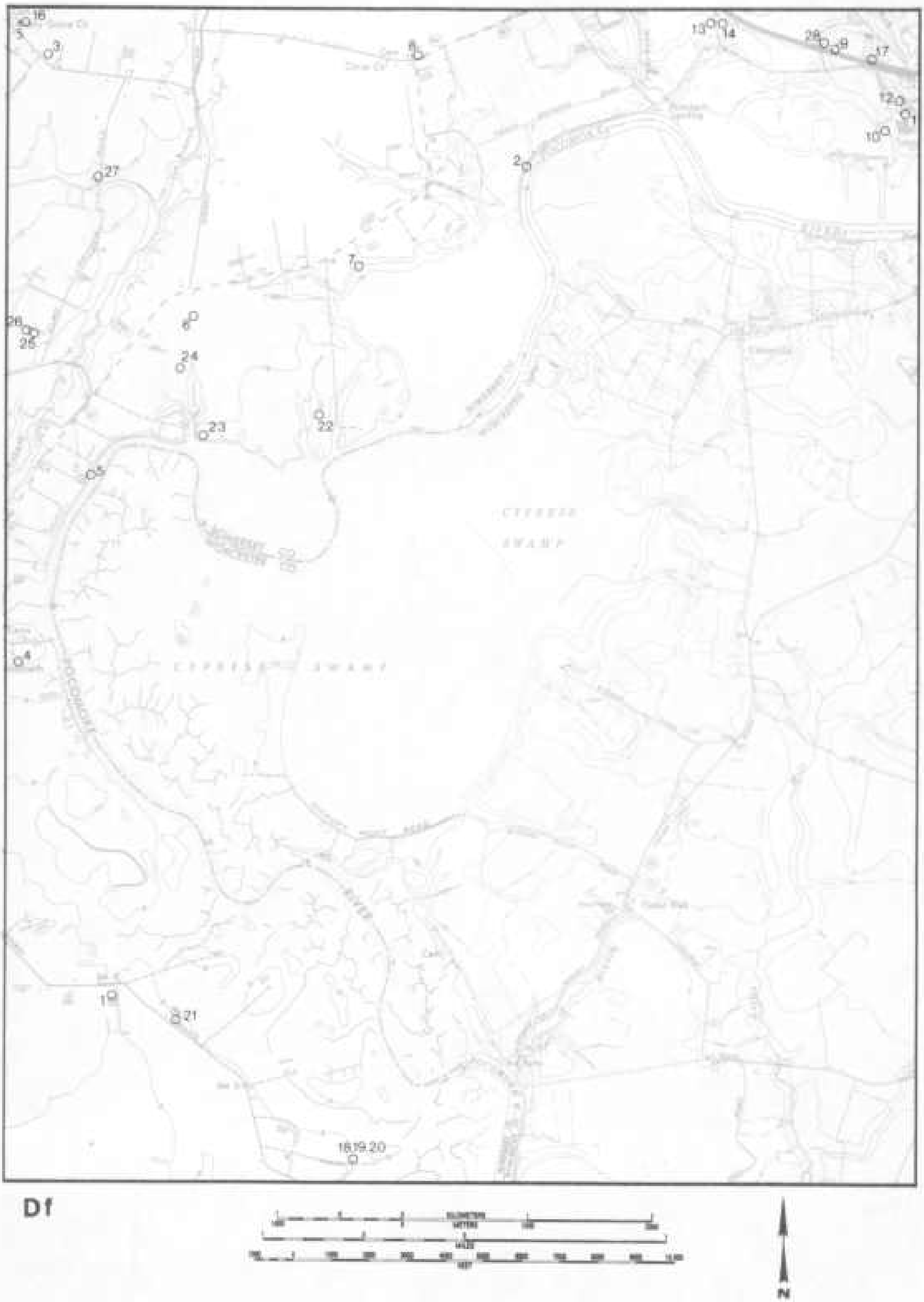

Dc


FAIRMOUNT NECK
1
2
4
5
7
8
12
14
15
16
17
18
19
20
21
22
23
24
25
28
29
30
31
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56,57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
9,10,27
26,32

Dd


41
27
25
5
4
20
31
19
21
22
15
38
1
39
26
17
18
36
35
6
3
11
2
12
28
8
7
16
34
30
32,33
14
29
42
40
10
23
24
13
9
N

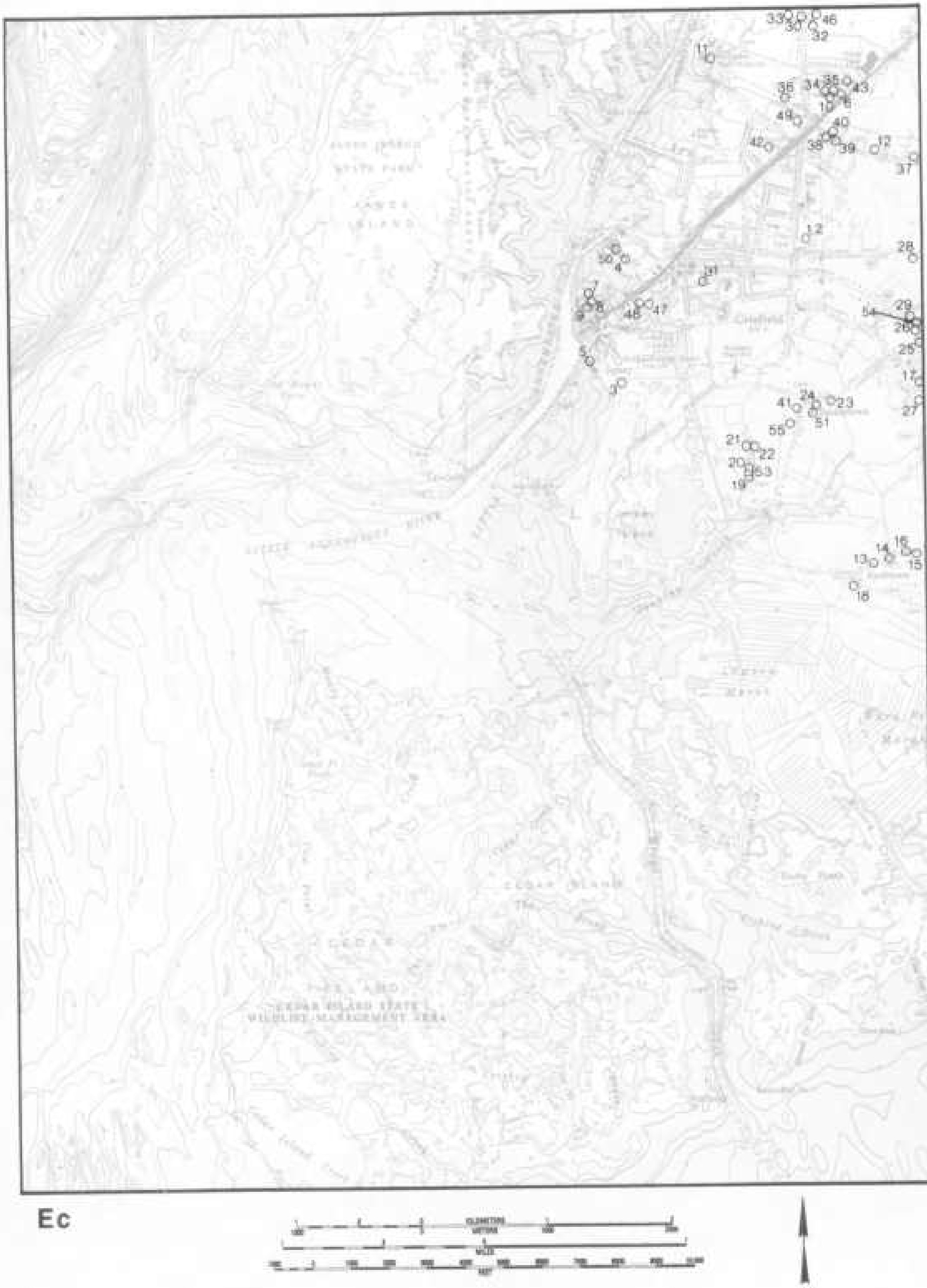
De


16
3
8
13
14
28
9
17
12
1
10
27
2
7
26
25
6
24
23
22
5
CYPRESS SWAMP
4
CYPRESS SWAMP
1
21
18,19,20
N

Df

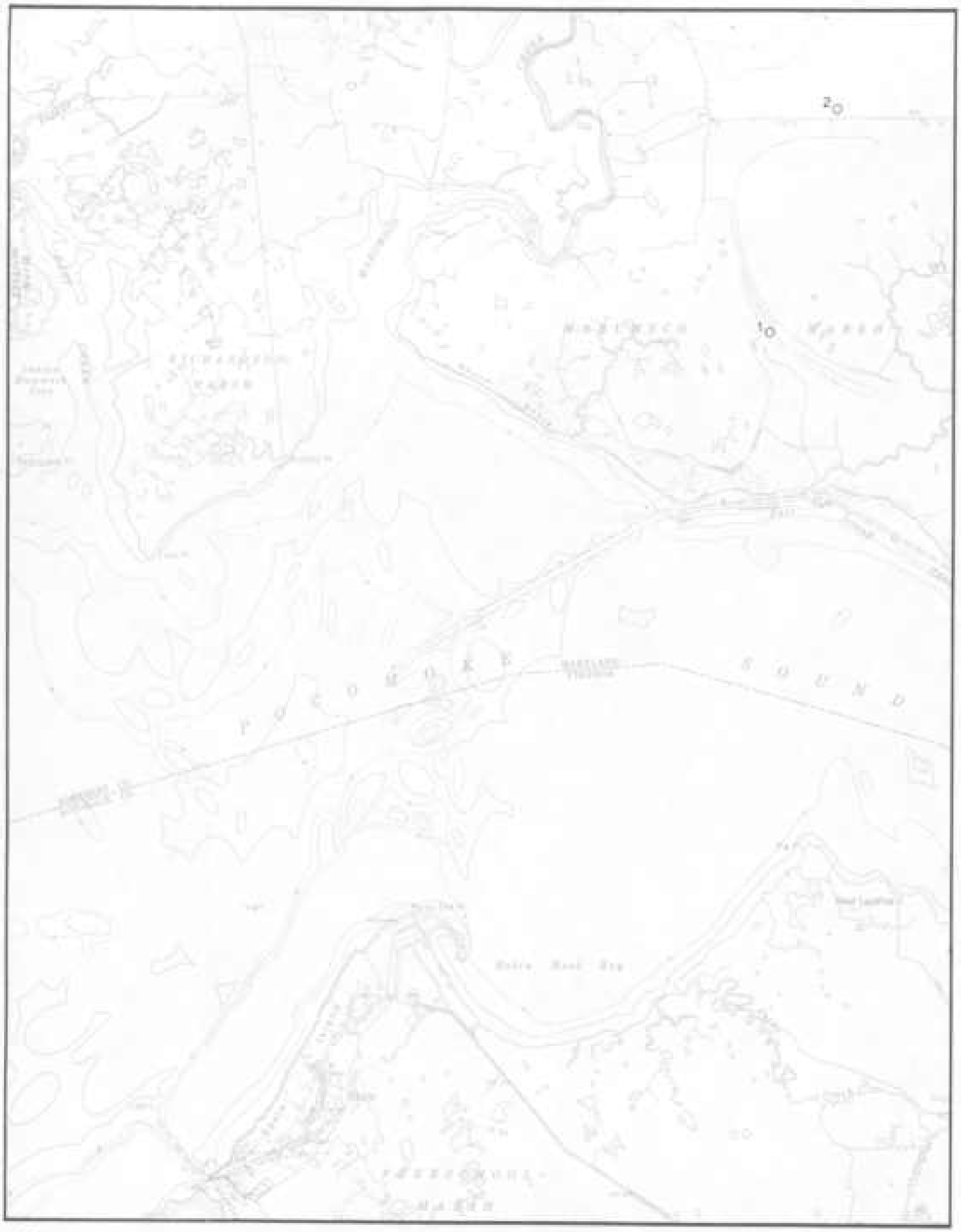

Dg


Ea



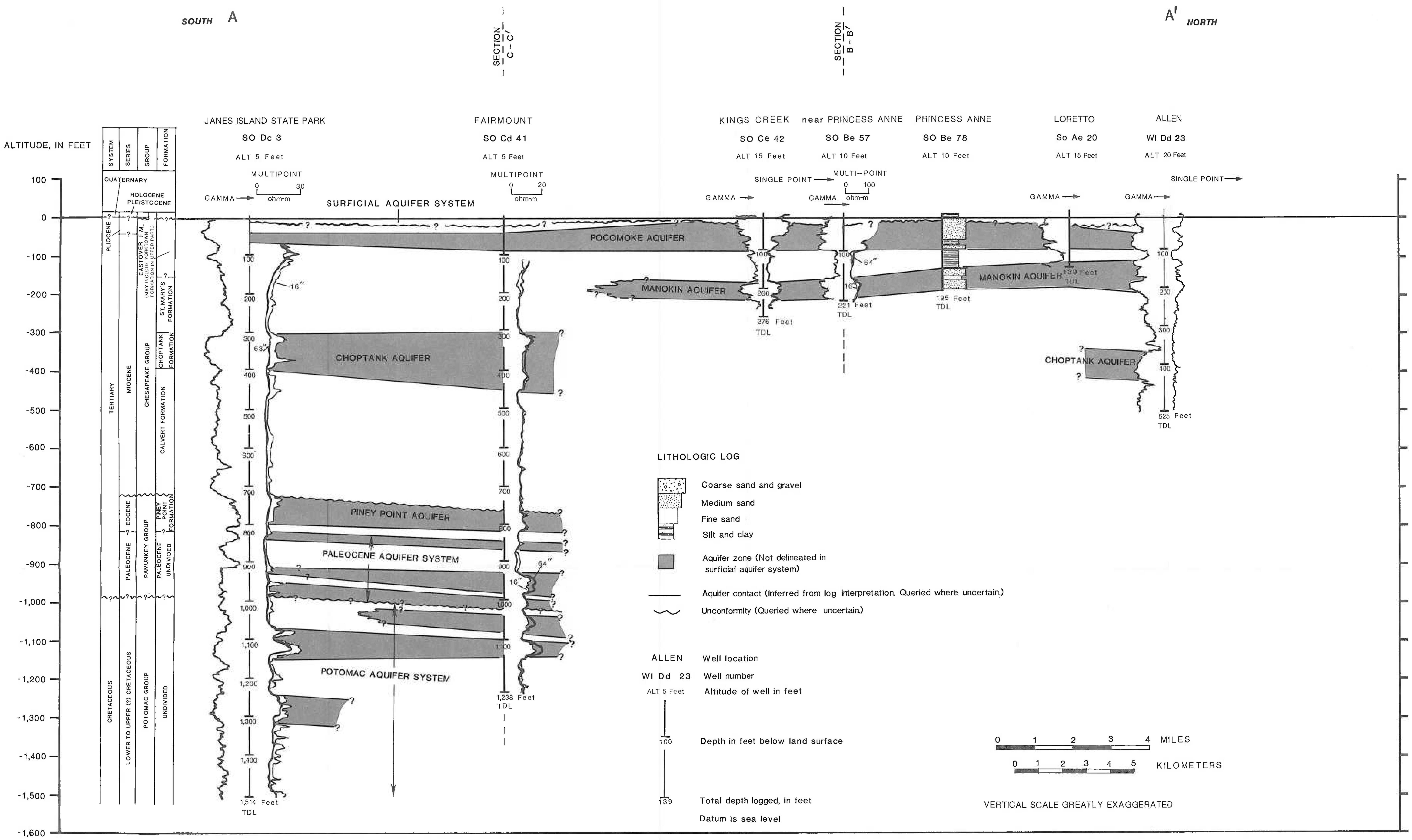
Ec


Ed




Ee


Ef



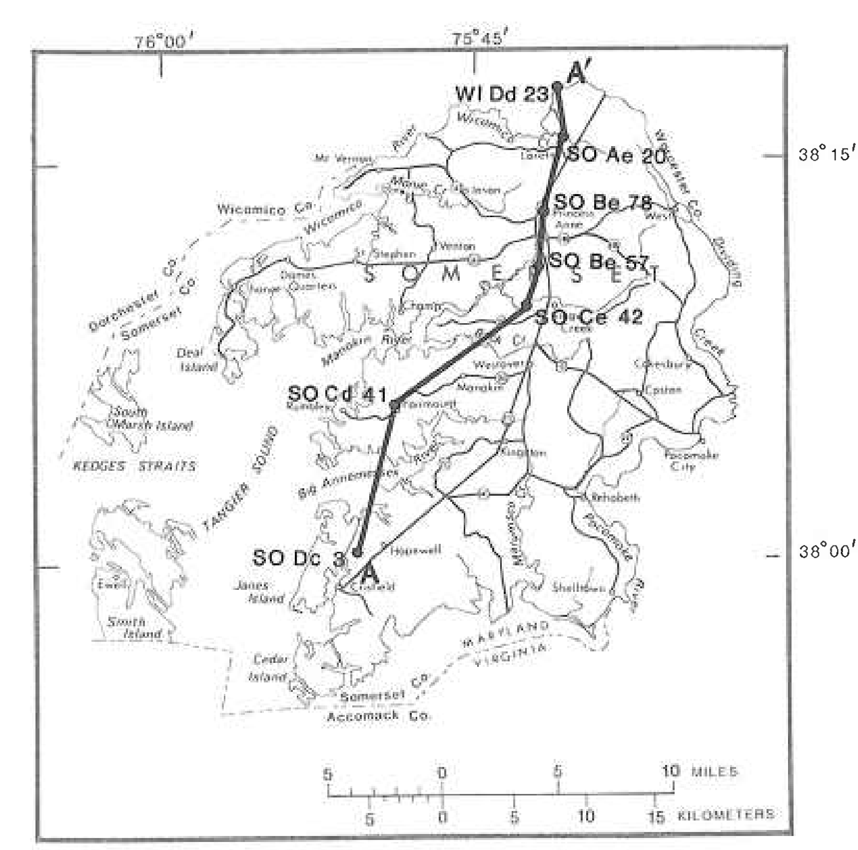




Plate 1. Hydrogeologic section A–A'

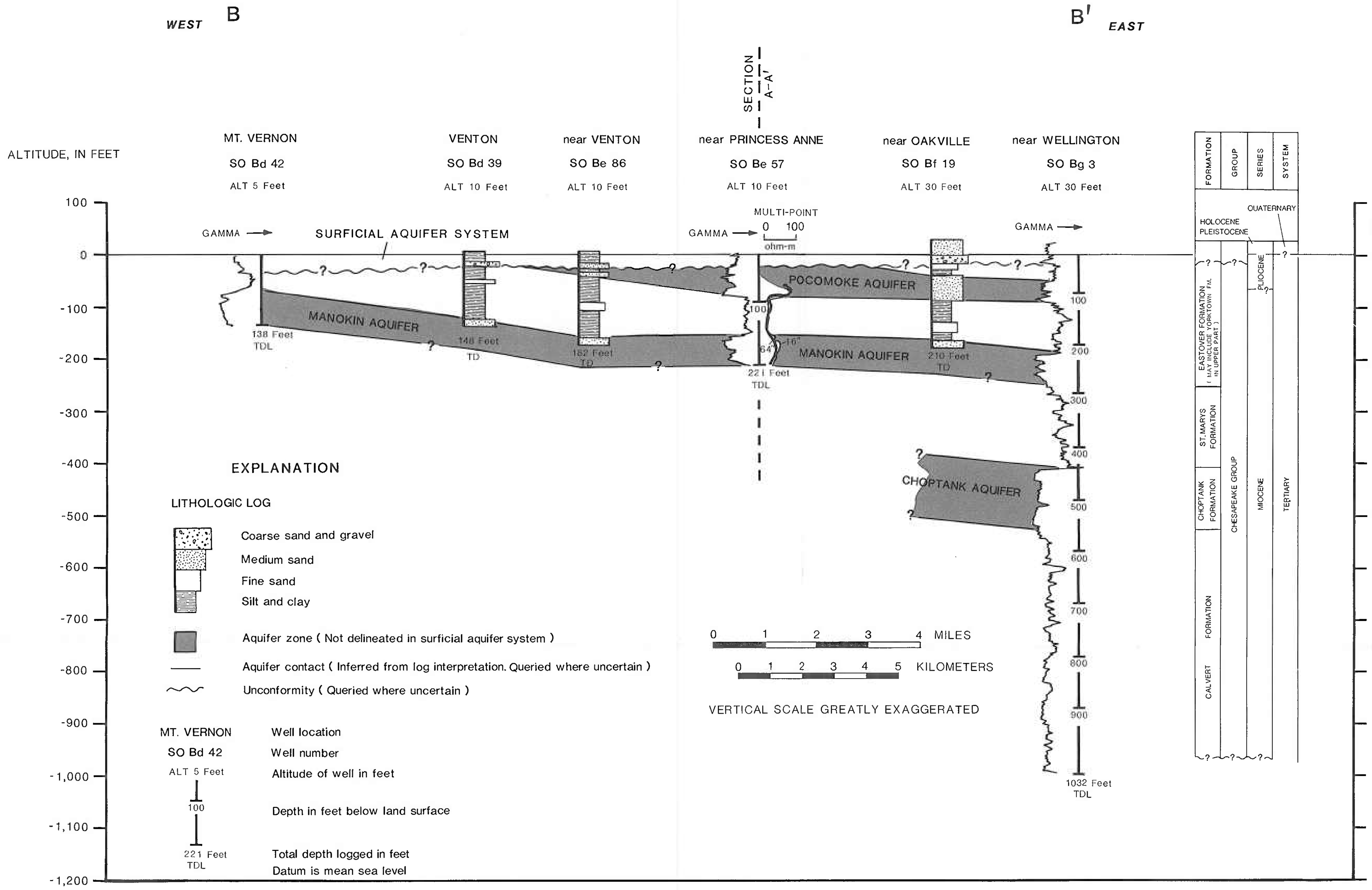
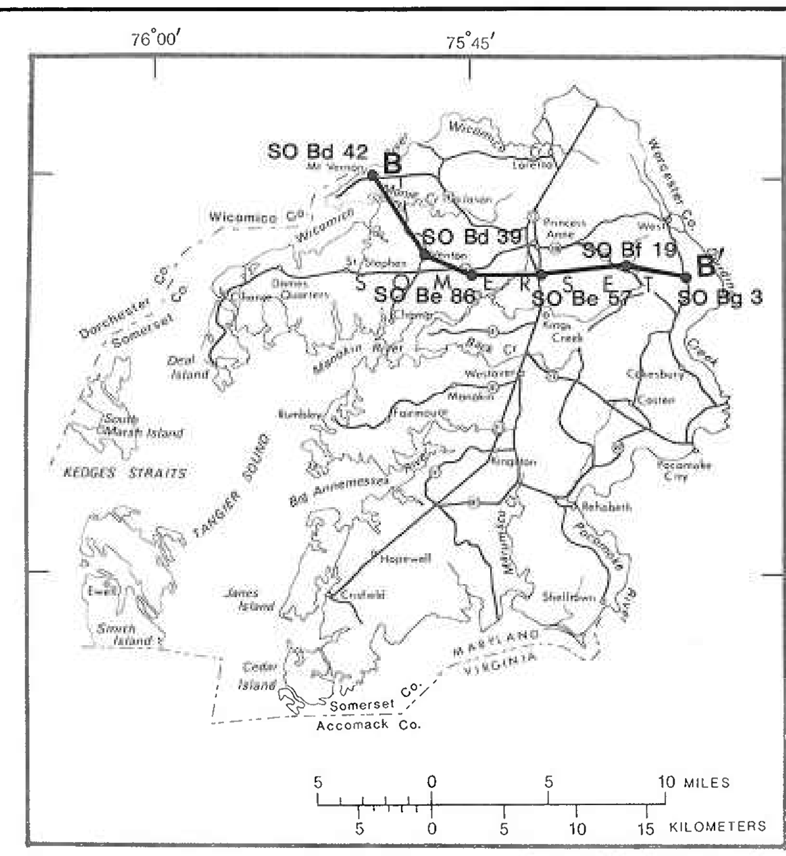



Plate 2. Hydrogeologic section B – B'



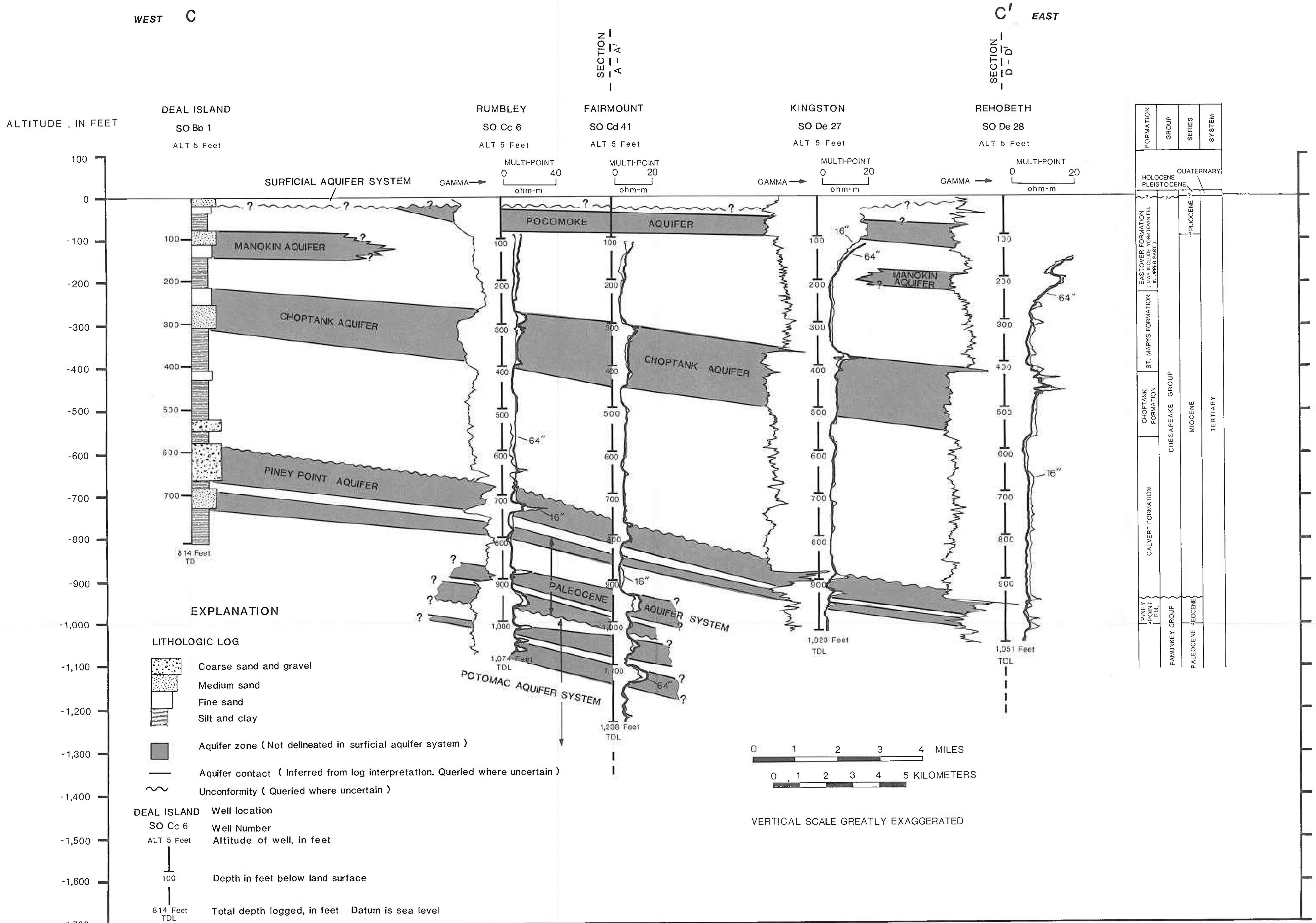
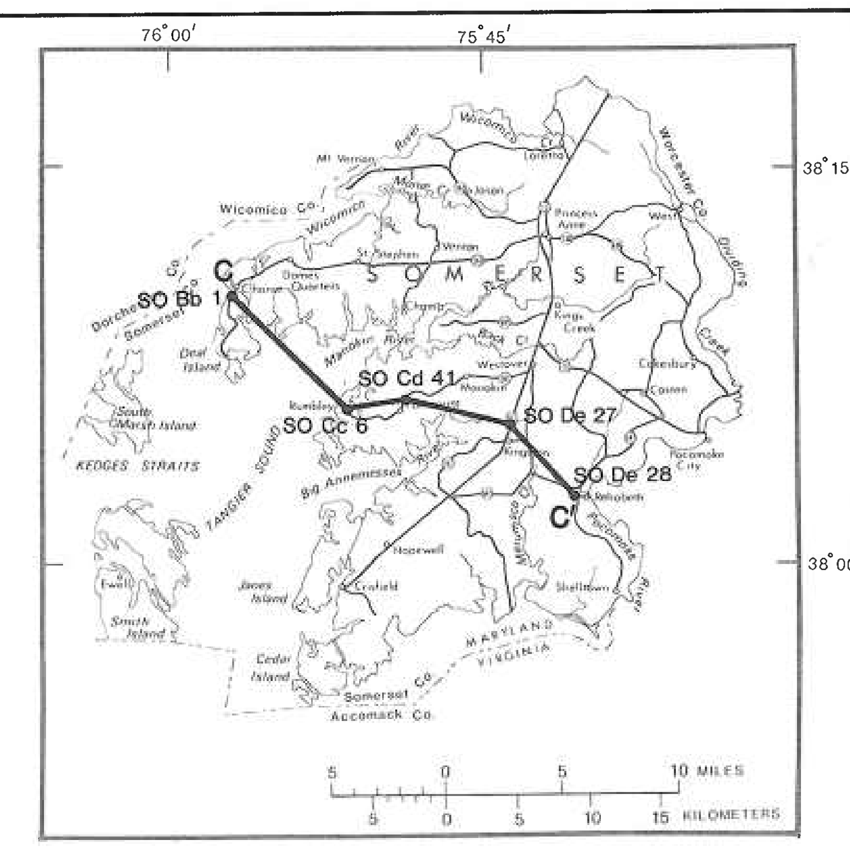



Plate 3. Hydrogeologic section C – C′



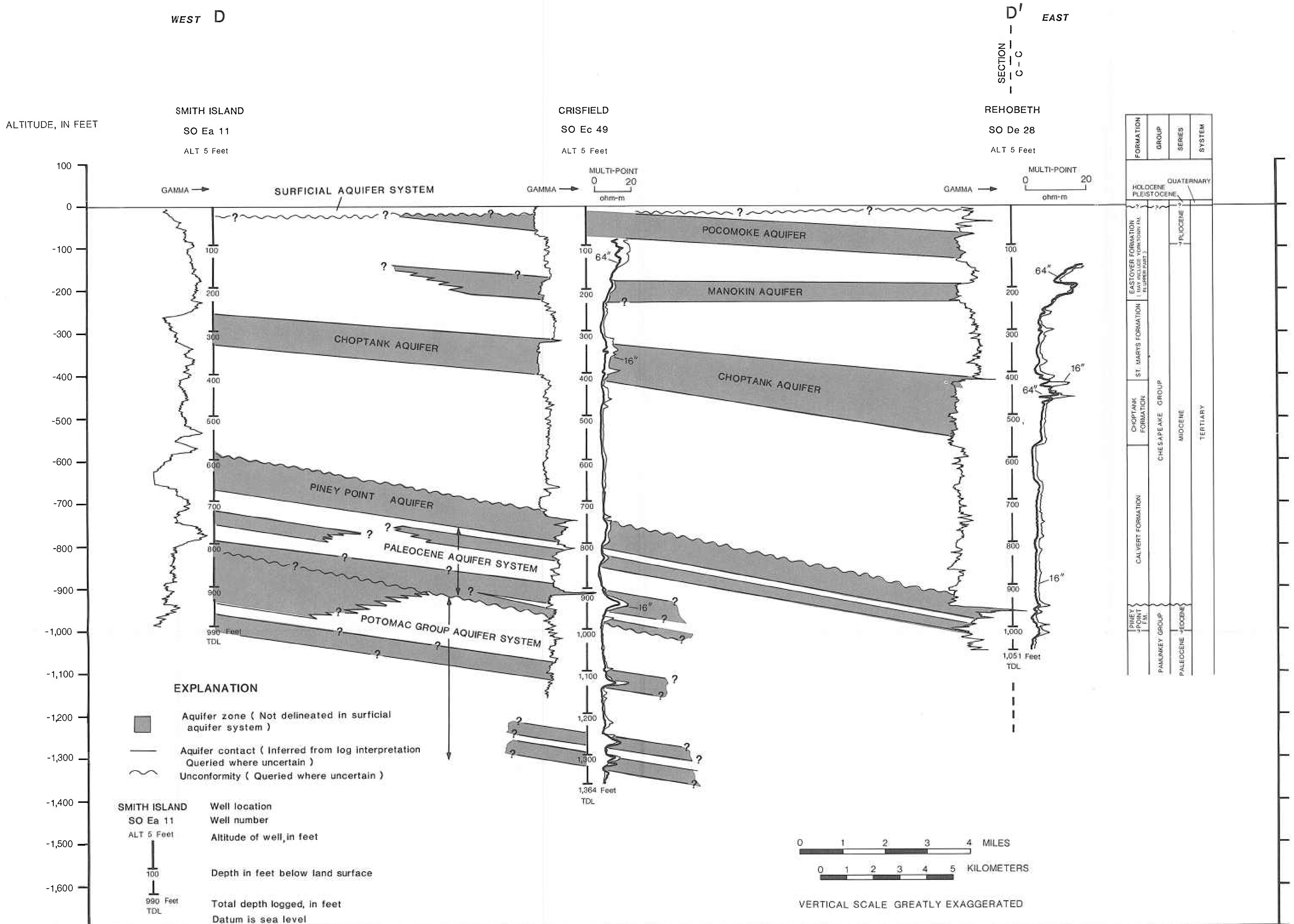
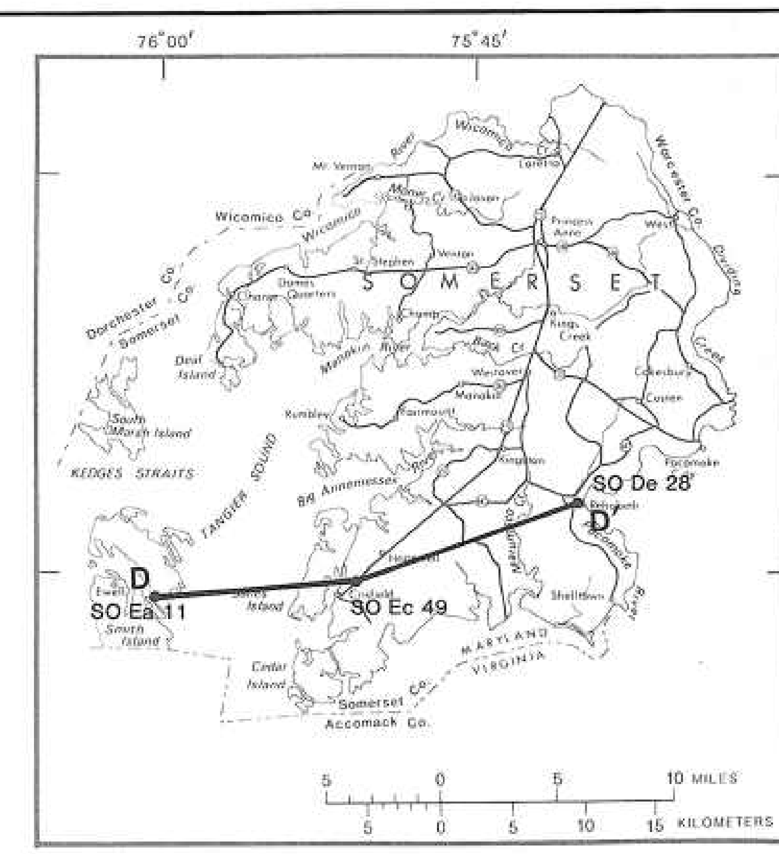



Plate 4. Hydrogeologic section D – D′



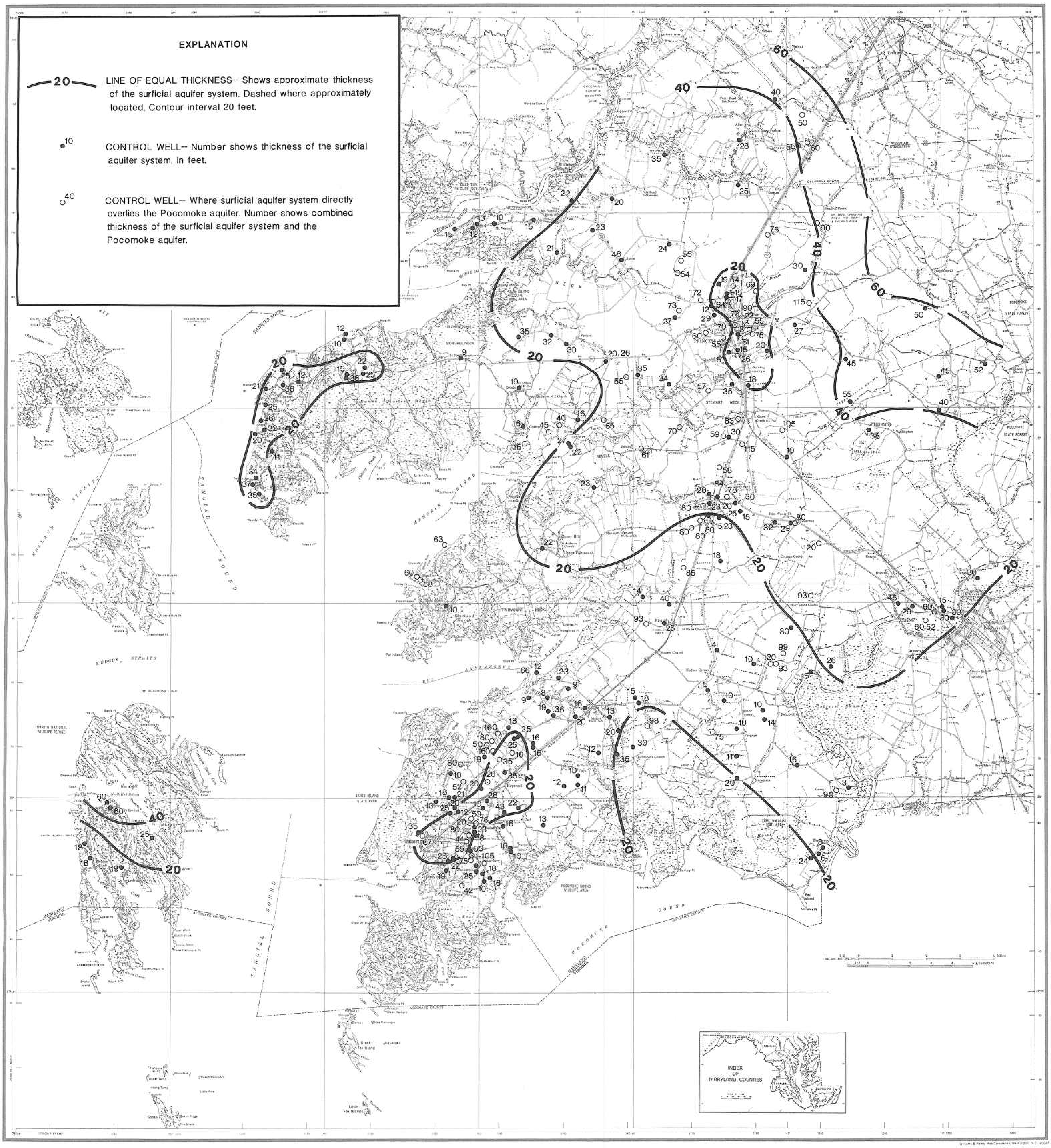



Plate 5.-- Map showing thickness of the surficial aquifer system in Somerset County, Maryland.

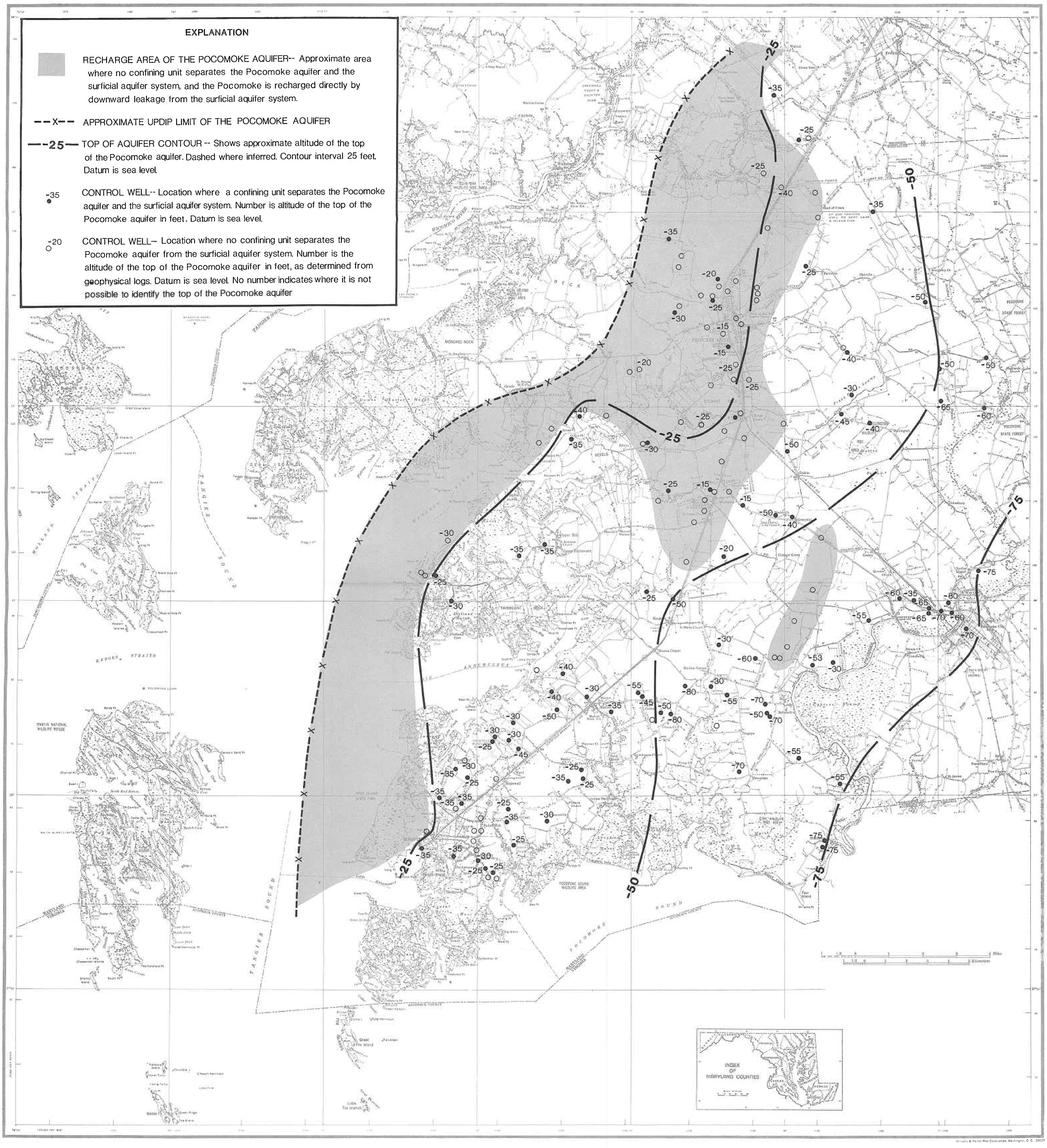



Plate 6.-- Map showing recharge areas and altitude of the top of the Pocomoke aquifer in Somerset County, Maryland.

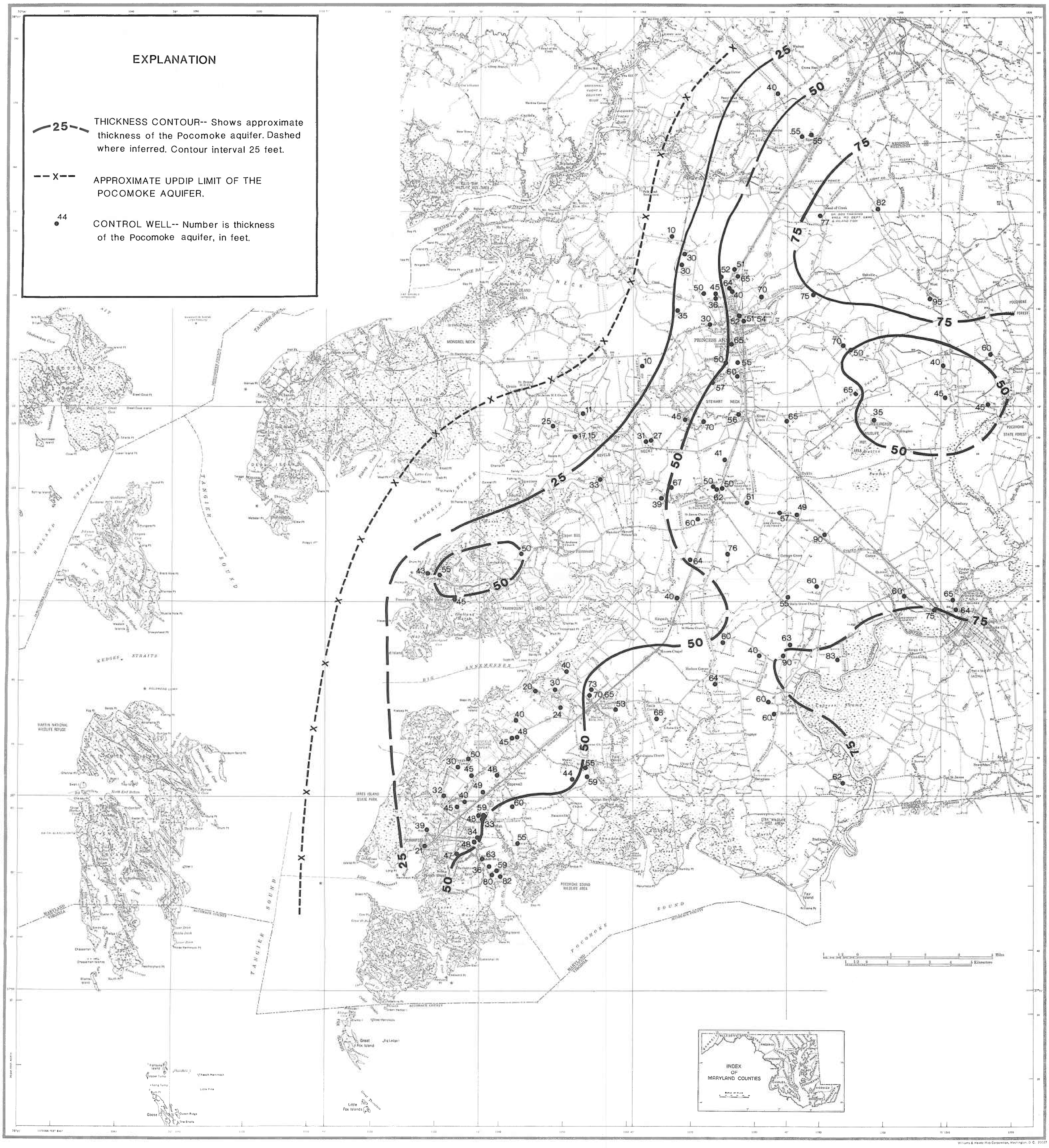



Plate 7. Map showing the thickness of the Pocomoke aquifer in Somerset County, Maryland.

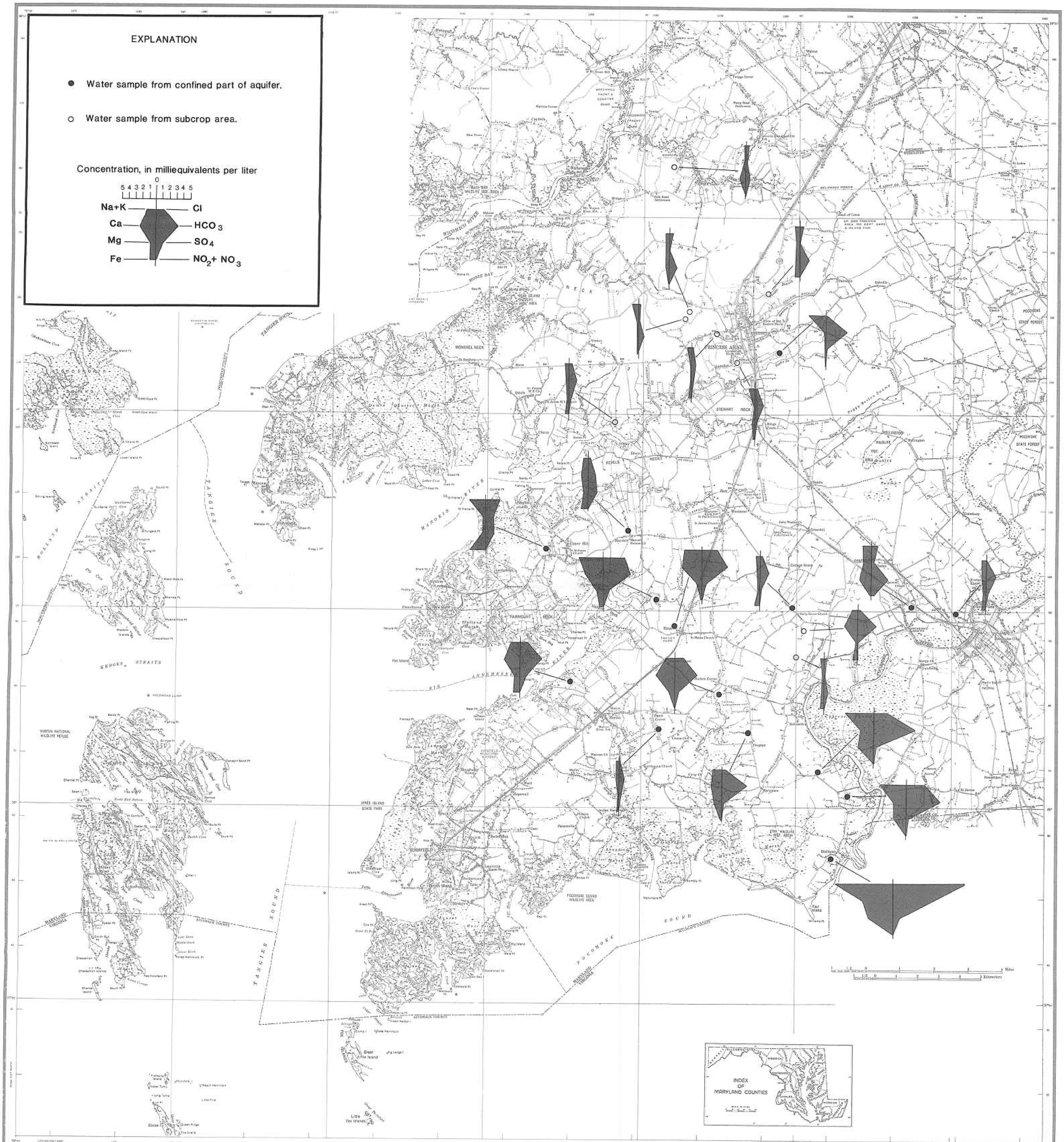



Plate 8.-- Map showing chemical characteristics of water from the Pocomoke aquifer in Somerset County, Maryland.

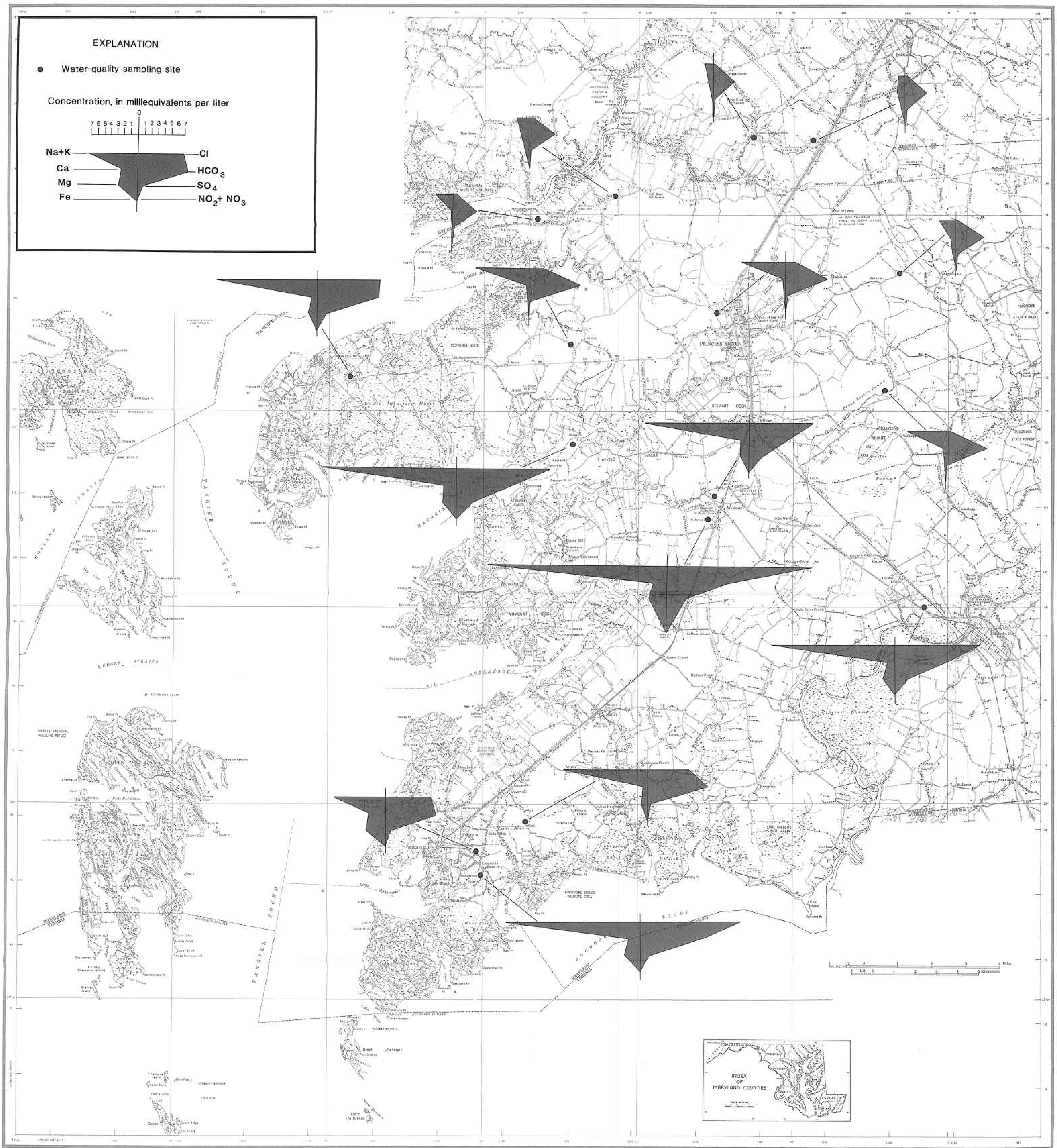



Plate 9.-- Map showing chemical characteristics of water from the Manokin aquifer in Somerset County, Maryland.